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Tanagra Terra Cottas.

THE SABOUROFF COLLECTION.*

THE monumental work by Dr. Furtwängler on the great Sabouroff collection is at last complete. We say "at last," not with any idea of the slightest reflection on the energy and zeal of either editor or publisher, whose labours have indeed been untiring, but because to eager subscribers the four years which have necessarily elapsed have seemed long. The Sabouroff collection has, as every one knows, ceased to exist. Before proceeding to consider in detail Dr. Furtwängler's book, it may be well to retrace briefly the history of this, perhaps the finest amateur collection of antiques that has ever been made. M. Sabouroff was for ten years Russian minister at Athens. He had every qualification for the work of a collector; keen love of art, highly-educated taste, ample means, and, last, but not least, unusual luck as to the time of his residence in Greece. The Tanagra excavations were just yielding their first and finest fruits, and it is in Tanagra terra cottas that the collection is richest; but, as we shall later see, M. Sabouroff was not carried away by the somewhat commonplace beauty of these too popular monuments; he diligently collected from every department and every period of ancient art, and his collection is unique in this, among other most important characteristics, that every single object contained in it has been found on actual Greek soil.

In 1880 M. Sabouroff came as ambassador to Berlin. It was a happy day for the Royal Museum there when he did. His collection was placed on view in the sculpture galleries and Antiquarium. In no museum of Europe could it have met with keener professional appreciation. It was, further, a happy day for M. Sabouroff, a day that secured the immortality of his name among archæologists, when he decided to have his collection published in a splendid illustrated work and to ask Dr. Furtwängler to write the text to accompany the plates. The work was at once put in hand. Dr. Furtwängler took down detailed descriptions of each monument, descriptions which form the basis of the present publication. The Photographic Society of Berlin undertook to photograph all the sculptures and a portion of the terra cottas. These photographs were sent to Paris to be reproduced by the heliographic process of M. Dujardin. For the reproduction of all the vases and such of the terra cottas as did not come out satisfactorily by photography, recourse was had to the coloured facsimiles of M. Eichher, whose drawings, by their wonderful fidelity, have gained him such a great reputation with the German Archæological Institute. Dr. Furtwängler frankly owns in his preface that the process of lithography by which these plates have been reproduced has, in some cases, impaired their beauty.

The plates were already complete, and a portion of the text had appeared, when M. Sabouroff had to leave Berlin, and decided to sell his collection. The result of the sale we noted at the time. It was highly characteristic. To St. Petersburg went what may be called the show portion of the collection,—the unrivalled terra cottas, with their delicate shapes, brilliant colouring, and world-wide prestige. At Berlin remained the more sober, but to the archæological mind far more precious, portion of the collection, *i.e.*, the early grave reliefs, votive slabs, vases, fragments of sculpture, bronzes, &c. At the Hermitage last autumn we saw the terra cottas set out with all the pomp and circumstance of imperial plate-glass and velvet, and we are bound to say with excellent artistic effect, but with no catalogue by which the unlearned might get further than the delight of the eye. At Berlin, three weeks before, we saw the marbles, bronzes, vases, &c., each standing orderly in its own place, each already entered in the catalogue of the section to which it belongs, and in which it is fully described and approximately dated. Of the collection itself, as a collection, Dr. Furtwängler's book is now the sole surviving testimony. Never, perhaps, had a collection such good fortune: fortunate in the circumstance of its formation, it has not suffered dispersion into private hands, but has found shelter in two of the finest museums of Europe, while its unity is still preserved in a book which takes rank at once as a standard treatise. The plan of this book we must briefly summarise.

It consists of two volumes. The first volume contains the Berlin portion of the collection, *i.e.*, the sculptures and vases, and numbers seventy-five plates, each with accompanying text. The second is the St. Petersburg portion (with one exception, plate seventy-six), *i.e.*, the terra cottas. Now, it is obvious that if the book consisted of simply plates and commentary it would be difficult, if not impossible, satisfactorily to review it in detail; we could but note for agreement or controversy a scattered opinion here and there; but a book conceived after such a plan, excellent though it might be, would not give expression to the peculiar bent of Dr. Furtwängler's genius: he is by nature quite incapable of remaining in the catalogue-commentary stage; he must take a general view, and summarise the results. Accordingly, he has taken the bold step of prefacing each section with an introductory essay, in which he boldly expounds his own view on some of the most hotly-controverted points in all the domain of archæology. How bold, how almost premature, this proceeding is he is the first to own. He says (we quote from the French book,—"Dans les introductions je me suis efforcé de traiter dans leur ensemble quelques questions particulièrement importantes qui se rattachent aux monuments de la Grèce en général. J'ai le sentiment d'avoir fait là un travail dont le moment n'était pas très heureusement choisi. La grande publication des stèles funéraires antiques, actuellement en préparation, permettra, je l'espère, sous peu de se prononcer, avec beaucoup plus de précision et de justesse sur plus d'un des points que j'ai touchés. De même après l'achèvement de la collection des terres cuites commencée par l'Institut Archéologique il sera possible plus tard de répondre plus complètement et mieux que je n'ai pu le faire aux questions que j'ai examinées. Je n'ai cependant pas cru devoir renoncer à publier ces études: en effet j'ai la conviction qu'il vaut mieux que chacun travaille dans la mésure où il peut s'en rendre maître, plutôt que d'attendre le moment où tous les matérieux seront soigneusement réunis au grand complet. Car puisque nous sommes encore à l'heureux age des découvertes, il faut croire qu'à ce moment-là nous ne serous plus de ce monde. D'ailleurs tout travail fait sur les matériaux bruts qui s'accumulent facilite pour l'avenir la tâche des chercheurs. Le sort de tout essai est d'être remplacé par un autre essai: et plus les travaux se remplacent, rapidement, mieux cela vaut, quand même nous devrions ne jamais atteindre à la perfection, car tout travail scientifique n'est jamais qu'un essai." Dr. Furtwängler is clearly not the sort of scholar to be stifled under the accumulations of his own learning. It is easy to see that the toil of detailed individual description of each particular slab and terra cotta has been lightened by the gradual dawn of new light, fresh generalisation of the whole. With these growing convictions we must not, he says, demand that every portion of a work extending over four years should be rigidly consistent, "Il m'était d'ailleurs impossible de demeurer parfaitement identique à moi pendant ces quatre années." Dr. Furtwängler is not of the order of preachers who can with comfort, and even pride, preach the sermons of twenty years ago. It is, therefore, not to the description of any individual monument

* La Collection Sabouroff Monuments de l'Art Grec publiés par Adolphe Furtwängler. Deux volumes. Berlin Librairie: A. Asher & Cie. 1883-1887.

that we shall turn, but to the general conspectus of each section, and the new theories set forth.

We take the terra cottas first, as having the strongest hold on popular interest, though in the book they occupy the second volume.

The terra cottas come, as we have noted before, mainly from Tanagra. A few scattered instances were gleaned from Corinth, Hermione, Thisbe, Megara; fewer still,—just sufficient to point the contrast of certain differences of style,—from Asia Minor. Before we come to the interesting and much-disputed point as to the purpose of these Tanagra terra cottas, we must note that Dr. Furtwängler agrees with the majority of commentators in thinking that the bulk of the specimens are post-Alexandrian. A few there are of distinctly archaic work, a few also of the fifth and early fourth century, but the vast majority bear all the notes of the so-called Hellenistic style. This style is specially shown by its *restless* method of treating figures at rest. Even Praxiteles kept enough of the ancient manner about him to make his figures really stand still, *i.e.*, support the weight of the body on one leg and let the other fall behind, additional support being often imparted by the trunk of a tree or some such object. But about the time of Alexander the standing figures all begin to walk, and it is largely this that makes us feel, with so many of the Tanagra terra cottas, that they lack repose and dignity. Of course, many of them are lolling about in every lax variation of attitude, but those that are simply upright are all more or less on the march. Another Hellenistic *note* is the arrangement of the drapery. Everybody has noticed the unpleasantly tapered effect of many of the Tanagra figures,—the folds are thin and scant about the breast, girt very high, with no overhanging folds, and becoming ample and abundant as they flow downwards; in fact, the figures tend to the extinguisher shape, like a modern lady with a small old-fashioned crinoline. It is this also that pleases the modern eye, which, from long usage, prefers a woman to have the shape of a cone with a curve in the middle. It is this also which makes the eye, trained to the idealised reality of the Pheidian drapery, shrink from the Tanagra schemes as not far removed from the tricks of modern mechanism. We ought to say that Dr. Furtwängler, with characteristic reserve, notes the Alexandrian manner, without commenting on its vulgarity. A third note of time is the shape of the fan held by so many of the Tanagra ladies. It is leaf-shaped, and quite other than the fan which appears on vases, even of the early fourth century B.C., whereas it is precisely identical with that which appears on Pompeian paintings; further, the pointed hat, so fashionable with the maidens of Tanagra, never appears on vases. Lastly, as regards style, the manner in which Eros is conceived is thorough post-Praxitelean; he is throughout the series the mischievous boy of Alexandria.

Coming to external evidence, we have the important fact that painted vases are never found with this class of terra cottas: we may, therefore, safely conclude that the fashion of making these vases had ceased before this peculiar kind of terra cottas had set in. Finally, we have the evidence of the recently-discovered Myrina terra cottas. These are known to date from the third to the first century B.C. Among them are several types obviously copied from Tanagra fashions; we may, therefore, presume that the Tanagra terra cottas preceded those of Myrina, but by no very long interval. Next, the question arises, whence did the Tanagra figure-makers (*κορόπλαστα*) draw their inspiration? Are we to look to their works for echoes of the great creations of sculpture or of painting? Not of sculpture, Dr. Furtwängler says emphatically. The *κορόπλαστα* of Asia Minor loved to reproduce statues in miniature, and we have only to look at the Myrina specimens now on view in the Campana Gallery of the Louvre to see instances enough; but at Tanagra it was otherwise. We have no single instance of the reproduction of the motive of any known statue. The reason does not seem far to seek: the age of Alexander was conspicuously an age of painters rather than of sculptors, it was by painting rather than sculpture that the minor arts of Bœotia were naturally influenced. This theory is borne out by the fact that in the paintings of Pompeii, which are echoes of the Alexandrian manner, we recognise abundant analogies to the pose, drapery, gestures of the terra cottas. With the terra cottas of Asia Minor it is just as naturally quite the reverse. After Alexander had come the great renaissance of sculpture in the Pergamene and Rhodian schools, when painting was comparatively in abeyance. This theory of Dr. Furtwängler's at all events tends to assist us to a juster appreciation of Tanagra excellences, an appreciation which to some of us, whatever their wide popularity, is uphill work. Their brilliancy, their restlessness, their vivacity, all unpardonable from the plastic point of view, become at least explicable when they are regarded as the outcome of strong pictorial influence. It has been usual to point to these terra cottas as helping us to realise the painted sculpture of the time of Praxiteles. Dr. Furtwängler thinks, as we do, that this is a grave error: the colouring is laid on in a way essentially pictorial, and gives no idea of its plastic purport. Finally, he points out, and we think here all will agree with him, the marked contrasts between the Tanagra figures and the later specimens of Asia Minor, contrasts which well bear out his theory of the different influences to which they were subjected. Tanagra bears the palm in finish of form, in delicacy of facial expression, in brilliancy of colouring. In these respects Asia Minor terra cottas look by their side coarse and unfinished, but when it comes to variety of subject, to sculpturesque largeness of manner, to diversity and directness of movement, Asia Minor is easily first. Students can readily make the comparison for themselves if they consult side by side Dr. Furtwängler's present book and the work on the Myrina terra cottas which we recently reviewed.

We come to the vexed question of the *purpose* of these terra cottas, and we have now to pass beyond the limits of æsthetic criticism to the large field of human faith and sentiment, as expressed in funeral customs. And we may say at the outset that we think Dr. Furtwängler has spoken a "clear disposing word" on a most tangled and intricate subject,—a word the more satisfying because it takes up and embodies so much of past theories, is so constructed out of well-worn material, that its novelty is rather in disposition than invention. It would be hard to lay one's finger on a single sentence and say this is absolutely novel, and yet the whole weary mass of tedious opinion, scattered conjecture, has shaped itself into a live conviction never felt before, — a conviction stamped with the impress of a cogent personality.

The question of the precise signification of Tanagra and other terra cottas would have been less difficult of solution had we possessed full and exact information into the circumstances of their discovery. Such information is unhappily in many cases lacking just where it is most essential, for terra cottas far more than vases bear the impress of local workmanship and local cults. Happily, of this much we are sure; independent terra-cotta statuettes,—*i.e.*, as opposed to those which were merely plastic ornaments of vases,—are found exclusively in either tombs or sanctuaries. At Pompeii, they are, indeed, placed merely as ornaments in niches in private houses, but this was when they had become *articles de luxe*, and we have no evidence whatever that this was at any time a Greek custom. The only purpose served by terra cottas in daily domestic life was that of *toys for children*. The industry of doll-making was, we know, of considerable importance among the Greeks; from it all statuette-makers took their name of *κορόπλαστα*; these *κορόπλαστα* had their regular shops in the Agora, and there they themselves disposed to children of the dolls they had made. Later, when the little girls married, they offered their dolls as anathemata in the shrines of goddesses, notably of Artemis and the nymphs. Dolls were also very naturally placed in the graves of children, for their use in the world below. So far all is clear and simple, but terra-cotta statuettes are found also in the graves of adults, and in these cases we must seek another explanation. Some archæologists have thought that as the child had her dolls, so the grown-up person had his statuettes, in which he took æsthetic delight, and which as *objets d'art* were buried for his delectation in his tomb. This is a plausible view, and one likely to find acceptance with those who have a superficial acquaintance with the Greek mind, and a general notion that they were a people of artists sunk in æsthetic contemplation. No custom could be really more unlike them, more wholly un-Greek, more opposed to the wholly practical,—we might almost say utilitarian,—nature of their funeral customs. They buried in their tombs whatever could be of use to the dead man: his arms, his clothes, his toilette utensils, his jewellery, it is true, but only because he could wear it; never, so far as we know, a single thing that could serve only for his contemplation. If objects of mere art had been wanted, why not stone statuettes, bronzes, pictures? Yet none of these appear.

It is otherwise as regards the gods. A large and less utilitarian view was taken of their needs and desires: an object of art, as such, could be offered to a god, though it was withheld from the tomb of a mortal; hence we must distinguish between the signification of terra cottas placed in sanctuaries and those in graves. In order to get at the meaning of these last, *i.e.*, of statuettes in the graves of adults which cannot be regarded as dolls, we must go back to the earliest instances, and trace the custom in its historical sequence. The secret of their purpose is sure to be found, if anywhere, in the earlier instances before the meaning became obscured by long tradition. Passing by Mycenæ, where the instances are so rare as to forbid generalisation, we turn to the tombs of Cyprus; there in large numbers are found rough figures curiously worked almost like small boards representing a nude female goddess, no doubt the protectress of the dead. These tombs are probably anterior to Greek influence. In archaic Greek tombs we find also a female divinity, but heavily draped, and with sometimes a child either in the arms or on the shoulder. Sometimes she holds a flower or fruit in the hand, sometimes wears a high head-dress. She is the mother goddess in the simplest form, the emblem of fertility of life, and, by antithesis, of death,—a conception common to many mythologies. She was a sort of general conception of the goddess feminine, whom by giving her various attitudes it was easy to transform later into a Demeter, a Cybele, an Athene. Another category of statuettes coming from archaic Greek tombs are representations of human figures occupied in doing some work pleasing or useful to the dead man,—a man baking or grinding corn, obviously for the dead man's sustenance. One Tanagra figure represents the operation of hair-cutting; others are of slightly less utilitarian cast,—a woman with the crotala or tympanon, a woman lamenting; a hydrophoros, *i.e.*, a woman carrying the funeral water-jar; figures of maidens carrying funeral offerings of cakes and fruit, youths carrying cocks,—in fact, personifications either of offerings to the dead, or, of what is scarcely distinguishable, the cult of the infernal deities. Figures of horsemen and chariots represent the funeral procession; the figure of a man reposing, holding the cup and the lyre, is the image of the dead man who receives the offerings. Lastly comes a class of objects, curious to our notions, the burlesques and grotesques. Their purpose is obvious: the dead man must not only eat and drink, he must laugh. The sorrowing Demeter, angry and averse, was made propitious by the fooling of a servant; in like manner it was wise to keep the dead man, now a potent hero, in good humour,—hence the figures of comic monkeys and Sileni.

In the next period, that of transitional and early fine art, we find a tendency to specialisa-

tion. The mother goddess becomes individualised in various ways: with veil and talathus she becomes obviously Demeter, with ægis Athene; a group of two goddesses who clasp each other's shoulders represents the divine mother and daughter, Demeter and Proserpine; but still many of the old traditional types maintain themselves side by side with the new. In the next period, that of late fine art, a marked difference is observable; the mother goddess with the attribute child is no longer a mere emblem of fertility, she is an actual mother with an actual child. Demeter and Proserpine have become two friendly maidens with scarcely a trace of the divine; the goddess with the pomegranate is a girl holding a flower, the youth bringing offerings to the tomb is a mere chance ephebos from the palæstra. In a word, the artist is busy with artistic motive, with pose and gesture, not with sacred meaning; by chance he adheres sometimes, indeed often, to the traditional type, but he is already forgetting what prompted these types. Such figures of every-day life are the large majority of the Tanagra terra cottas; and it seems at one time as though all trace of sacred intent must disappear, and the motives of terra-cottas degenerate into mere genre; but just at the critical moment, a reaction sets in. We find in the post-Alexandrian terra cottas a marked return to mythology; maidens begin to turn into Muses and nymphs and Bacchantes, youths into Erotes, Aphrodite begins to reign supreme, Eros and Psyche appear. The fact of this reaction, Dr. Furtwängler has noted and most ingeniously explained. It is a revival of the old cult of the dead, but with a difference, of the dead man not haunting his tomb and requiring food and drink and an occasional coarse joke, but of the dead man in Elysium,—the dead man who chants in the chorus of the initiated, the beatified soul of a later faith to whom the Muses and Dionysos and the Love-gods must minister,—of such a faith we have abundant literary evidence, from Pindar and Aristophanes onwards. Thus from beginning to end we have a continuous tradition. Terra cottas buried in graves to satisfy the dead man's material need, and to consecrate his resting-place; later the same custom continued, but the artist, half forgetting his purpose in the human beauty of his work,—"Il n'y a nullement rupture complète avec l'ancienne tradition; celle-ci perce, au contraire, encore sur beaucoup de points, elle est seulement transformée en ce sens que partout ont triumphé les exigences purement artistiques qui ne réclament que la beauté et plus encore l'élégance": and lastly, a return to the unreal, to the old presentation of the unseen, to the presentation of the life and function of the beatified.

Whatever added interest of detailed interpretation future investigation may add, we feel sure that Dr. Furtwängler has given us the right clue, and with this in our hand, we can wander among the motley throng of gods and goddesses, Sileni and Satyrs, Mænads and Muses, high-hatted fan-bearing maidens and matrons, feasting heroes, and hair-tearing Sirens, no longer, as before, puzzled and confused, but marvelling only at the genius of those who could people their tombs with a crowd of fancies so diverse and so gracious.

NOTES.

THE question of St. Martin's Church has drawn three letters in the *Times*, from Mr. Butterfield, Mr. Beresford Hope, and the Rev. E. C. Hawkins, the Rector of St. Bride's, Fleet-street. Mr. Butterfield totally condemns the proposal shown in the Board of Works' model, referred to last week, for inserting flights of steps between the columns, and leaving them each on a separate pedestal; but he proposes instead, as what he fears is inevitable, the removal of the front rank of columns from the portico, thus throwing it and the steps back by one intercolumniation, and saving 12 ft. of road. In the opinion that the Board of Works' expedient will spoil the building we quite concur, as already observed; but that it should be regarded as a lesser injury to the design to remove a whole colonnade and deprive the portico of half its depth and shadow, seems to us one of the oddest of paradoxes to come from an architect. Mr. Beresford Hope's letter is simply a warm protest, without any consideration of the logic of the case. Mr. Hawkins, who protests, adds, however, a reason,—to wit, that from his own frequent and special observation there is no block at the bottom of St. Martin's-lane, that the roadway is wide enough for the traffic, and the grievance is an imaginary one. Our observation coincides with that of Mr. Hawkins. We cannot remember to have observed any block or delay of the traffic there. What there may be some day is another question, of course. But for the present the Board of Works' desire to tamper with the façade of St. Martin's seems to us to have no better justification than that blind and superstitious reverence for a straight road by which official minds have been of late years so carried captive, that they would probably be ready to pull down St. Paul's if they could thereby shorten any street route by five minutes.

MR. MUNDELLA'S views as to the course it is desirable to adopt in the House of Commons with regard to the Railway and Canal Traffic Bill appear to be quite in accord with those of the Railway and Canal Traders' Association. The following resolution was unanimously adopted by the Council of the Association on the 6th inst:—"That the Council strongly object to the proposed reference of the Railway and Canal Traffic Bill to a Select Committee, and they trust that the Government, by reasonable concessions to the views expressed on behalf of traders and agriculturists on the subjects of undue preference to foreign produce and the proposed allowance of station terminals, will provide for a discussion of the Bill in Committee of the whole House." When reviewing the prospects of the session last week, Mr. Smith said that it was impossible that the Government could give time for protracted debate on the second reading of this Bill, but that opportunity might be found towards the close of the session for discussing it in Committee. Mr. Mundella again took the opportunity of protesting against the Bill being sent to a Select Committee, and expressed a hope that the Government would give speedy facilities for its consideration in Committee of the whole House; whereupon Mr. Smith stated that this was one of the measures they desired to pass if there should be time for the adequate discussion of the different points arising in connexion with the subject. Several members have given notice of amendments bearing on the points alluded to in the resolution just quoted, and every effort will be made to render the measure practical and beneficial.

MR. JOHN FIELD has sent us the eighteenth annual number of his Analysis of Metropolitan, Suburban, and Provincial Gas Accounts,* being that for the year 1886. Like its predecessors, this number is a model of clearness of arrangement and beauty of printing; the bird's-eye view which it gives of the working of thirty-four distinct gas enterprises is both instructive and satisfactory. The consumer gets his gas cheaper and cheaper, while the dividends on capital are not impaired, the growth of the business affording its proper increment of profit. The receipts for the sale of residuals continue to fall off, but, on the other hand, the price of coals is generally lower than in 1885. One of the comparisons that catch the eye in Mr. Field's tables shows how much more brilliantly the metropolis is lighted than are the great country towns. The three metropolitan gas companies have 2,766 miles of main, while nine great corporations have an aggregate of 2,633 miles. But, while the former undertakings have 104 consumers to the mile against 136 per mile for the latter, the former sell eight million cubic feet per mile, the latter little more than half that quantity. Despite the greater brilliancy of the shops, the streets of the metropolis have twenty-five public lamps per mile of gas main, those of the provincial capitals only twenty.

* London: Eden Fisher & Co., 50, Lombard-street.

THE French papers announce that the Directors of the Panama Canal have resolved on inviting a fresh loan, which is put at 500,000 obligations at 440, or 56 per cent. discount. The successive liabilities already incurred by the Company are as follow:—

1881	Estimated cost of Canal complete	£24,000,000
1881 March.	Company organised with constituted capital	12,000,000
1882	Loan at 5 per cent.	5,000,000
1883	Loan at 3 per cent.	12,000,000
1884	Loan at 4 per cent.	7,747,740
1886	Loan at 3 per cent.	18,352,080
	Total responsibility	£55,099,820

The produce of the above securities, less 5½ per cent. commission, has been:—

Stock	£12,000,000
First loan	4,375,000
Second loan	6,840,000
Third loan	5,160,000
Fourth loan	8,059,499
Cash received	£36,434,499,

showing a rebate of 43·4 per cent. on the loans. By the close of the present month we may expect to learn what proportion of the work of the canal has been executed for the money spent.

FROM time to time rumours have been prevalent as to laxity of administration, not to say the existence of jobbery, in some departments at the head-quarters of the Metropolitan Board of Works in Spring-gardens. One of these rumours had reference to the circumstances under which the land upon which now stands the London Pavilion Music Hall was let. The matter, it seems, has been under the consideration of the Board for some time past, and at the meeting to be held this Friday, the 15th inst., the Works and General Purposes Committee of the Board will present a report,—

"Submitting, in pursuance of the resolution of the Board of the 3rd of December, 1886, a statement of the facts connected with the letting of the land at Piccadilly-circus:

Reporting the result of an investigation which the Committee has made into matters arising out of the above reference:

And stating that, in the opinion of the Committee, Mr. Robertson, of the Architect's Department, has been injudicious in allowing relatives to become tenants of the Board without informing the Board; but that the Committee does not find that there has been anything worthy of more severe censure."

We quote these sentences from the Board's *agenda*, but we trust the full report of the Committee will be published, and that the whole subject will be fully sifted at the meeting of the Board. The public interests, no less than the interests connected with building, demand that the proceedings of the Board and its officers should be beyond suspicion. We notice that some members of the Board are not inclined to take so lenient a view of Mr. Robertson's conduct as the Committee is disposed to do. Mr. Mossop has given notice that on the motion to agree with the report of the Committee he will move, as an amendment:—

"That, in view of the circumstances disclosed in the statement submitted by the Committee, the Board regrets to be unable to come to any other conclusion than that it is inexpedient that Mr. T. J. Robertson should remain in the Board's service; and that he be dismissed accordingly."

Mr. Price has also given notice of the following amendment:—

"That, in the opinion of the Board, the conduct of Mr. Robertson, as detailed in the report of the Works and General Purposes Committee, has been such as to render it undesirable that he should remain in the service of the Board."

MR. FREDERIC HARRISON'S paper on "The Sacredness of Ancient Buildings," read at the annual meeting of the Society for the Protection of Ancient Buildings, and now published in the current number of the *Contemporary Review*, is an eloquent and ably-written appeal on the conservative and reverential side of the question, as Mr. Harrison knows so well how to write. As

a statement of one side of the question nothing could be better, and Mr. Harrison even shows some glimmering of perception that there is another side, in his reference to the fact that the clergy regard a church as the place where their official work is done, and may, therefore, naturally be expected to wish to keep it in repair and even to make additions to it when necessary. Mr. Harrison, it is true, stigmatises this feeling as false and dangerous, "a dreadful temptation"; it is something, however, that a lecturer at the "Anti-Scrape Society" can even recognise the fact that it is a not unnatural feeling. It is odd, however, that a student of history like Mr. Harrison should appear quite blind to the fact that this worship of ancient buildings is entirely a recent development of feeling; that when architecture was a living interest, people would not scruple to remove any old building to put up one that suited them better; and that the blind worship of ancient buildings is really an indication of a country having lost confidence in its future, and clinging despairingly to the records of its past. We have read many passages in the article, however, with pleasure and sympathy; among others the following:—

"Statues and paintings are the creations of single Masters. Buildings are the collective growth of Ages. But for this very reason, what buildings lose in personal interest they gain in human interest, in social significance, in historical value. The multiplicity of parts in a great edifice, the vast range of its power over an infinite series of human souls, the sacrifices, the endurance, the concentration of efforts by which it was built up, and the countless generations of men who have contributed to its beauty or have been touched by its majesty, give it a collective human glory, which no statue or picture ever had,—a glory which is exceeded only by the great poems of the world. . . . . A great national building is the product of a nation, and is the school of a nation. And for this reason it should stand next in reverence and love to the great poems of a nation. Next to the 'Iliad' and the 'Trilogy' comes the Parthenon. Next to the 'Divine Comedy' the Duomo of Florence and its adjuncts. Next to Shakspeare and Milton, the Abbey."

IT is a pity that "A Sanitary Engineer" who wrote a letter to the *Times* on Saturday last on "the effects of continued drought on water supplies," should have thought it necessary to wind up an otherwise very useful and sensible letter by a sneer at a what he termed the "waste of water in foolish fountains." He referred especially to the fountains in Trafalgar-square, and there is no doubt they are poor concerns enough; but it was obvious that the "Sanitary Engineer's" complaint against them was not that they were poor fountains, but that they were fountains at all, and that in such an object as a fountain the sanitary engineering mind sees nothing but a waste of water. This is only one instance out of many of the manner in which, doubtless for some wise purpose, sanitary authorities and professors seem created usually without any sense of the beautiful. If the use of water in a fountain is foolish waste, the use of any material to produce mere beauty is foolish waste also. The fact is that a finely-designed and liberally-supplied fountain is one of the most beautiful additions that can be made to a public square or *place*; not only a beautiful object, but with the additional beauty of change and movement; as Browning has so finely described it in his allusion to the fountains before St. Peter's:—

"How these fountains play
Growing up eternally,
Each to a musical water-tree."

We should be very glad to see the fountains in Trafalgar-square removed to give place to better ones; but for any one to talk of fountains as a foolish waste of water is only a proof of his own insensibility to beautiful things. There is no more refreshing and cheering object in a crowded and heated city than the sight and sound of a fountain, and we only wish there were more and better ones in London than there are.

A NEW patent, taken out by Mr. T. C. T. Walrond, Associate Inst. C.E., for facilitating the connexion of house-drains with sewers, deserves notice. The object is to simplify the making of connexions between house-drains and street-sewers by the use of a special junction-pipe or block, the mouth of which points upwards. When the sewer is being made pipes are carried up vertically in the sewer trench without any extra excavation from the junctions to within a foot or two of the surface of the road. All deep digging when the house connexions are laid in is thus avoided. The junctions may be made to act as junctions and traps in one. Of course, in some situations the difficulty of practically rendering this contrivance available would be that it would not always be possible to foresee where future junctions would be required. But in the case of a street or a building estate already laid out in lots, the points where connexion will be required can be pretty well localised, and under such circumstances the improvement seems calculated to be a very practical and useful one.

IN a pathetic article entitled the Disembowelling of Venice, headed with the text from Isaiah, "Who hath taken this counsel against Tyre, the crowning city, whose merchants are princes, whose traffickers are the honourable of the earth"? (xxiii. 8), Signor Giacomo Boni laments the vulgarisation of his native city at the hands of the municipality and bric-à-brac hunters. The palaces on the Grand Canal, he says, have been reduced to skeletons; the balconies, the window-openings, are lined with hotel signs or the placards of furnished apartments, or of dealers in antiquities, who, "after stripping our sumptuous palaces of their ceilings and cornices, and even the architraves of the doors, are replacing them with modern imitations. The South Kensington Museum has already some two or three hundred pieces of marvellous Venetian sculpture, among the rest the marble tops of our wells. Byzantine, Gothic, and Renaissance, adorned with ornaments and symbols, representing the art of eight centuries; the emblematical bas-reliefs which once adorned our ancient houses and the homes of Mediæval art guilds; balconies, and complete windows with their dressings. In a short time the very skeletons of these palaces will have been carried off piecemeal and rebuilt in some English park, or perhaps between a coal-yard and a tannery in Chicago; the Grand Canal will be filled up and the palaces replaced by five-storied houses with iron roofs, cement cornices, cast-iron balconies, pale yellow plaster, and red railings. The apse of the church of the Frari will be rebuilt, and an inscription upon it will record that the bricks were made on purpose, and are of the same size as those used in the fourteenth century." This forecast is, perhaps, not in all respects so improbable as it at first appears, and the Venetians will do well to consider that in divesting their beautiful city of all that makes it interesting they are in truth killing the goose with the golden eggs.

DURING this summer the old seat of the Fane family at Fulbeck, Lincolnshire, will be sold at auction. The land lies in Loveden Wapentake, ten miles distant from Grantham and Lincoln, and includes a portion of the well-known Heath sheep range. The manor, together with its six farms of arable and grazing land, extends over 1,500 acres. The Fanes settled here in the early years of the seventeenth century. The parish stands on Cliff-row, an acclivity close to the ancient Ermine Way. Also to be sold is Wrotham Hill Park, an estate of, say, 800 acres, on the high chalk hills between Sevenoaks and Maidstone, near to Weobley Station. Wrotham is of considerable antiquity, many remains having been dug up here which point to British and Roman settlements. Some ruins of the archbishop's palace may be found adjacent to St. George's parish church. Built in the Early English and later styles, the church was founded by William of Wrotham, a governor of Dover Castle *temp.* Henry II. His supposed tomb and coffin were discovered at the restoration of the fabric thirty years ago.

THE final service at the French Protestant Church, St. Martin's-le-Grand, was held on Sunday, May 29th last. Pending the building of another place of worship, the congregation will meet for a while in the Athenæum Hall, Tottenham Court-road. The demolition of the church, and of some of the neighbouring property, is now in progress, by way of clearing a site for the enlargement of the General Post Office. The Great Northern Railway Depôt is removed from the Bull and Mouth to new premises in Bread-street, Cheapside; and Bull and Mouth-street will be eventually built over. The cost of the new departmental building is calculated at 125,000*l.*, exclusive of the ground and compensation awards. In the Parliamentary estimates now before the House of Commons an aggregate of 388,000*l.* is scheduled in respect of various post-office buildings throughout the country.

THE long-continued sunshine of this summer has naturally called the attention of householders to outside or sun blinds. Those who are well off can afford to go to the expense of putting them up, but even in well-appointed houses they are confined to a few rooms. In small houses ineffectual attempts are made to shut out the heat by drawing down Venetian or other inside blinds. But they have next to none of the effect of an outside covering. In fact, Venetian blinds inside a window are some of the foolish things of the modern builder; if they are placed outside they are in their proper place. The most effectual of all shields against the sun and heat are outside wooden shutters, which ought to be affixed to every country-house, as they keep out the cold in winter and the heat in summer. Those, however, whether being in town or country, who cannot afford regular outside blinds, can do much to keep out the sun and heat by hanging a piece of canvas or sacking over the windows from the outside. It can be hung to a couple of nails above the window, and kept in its place by a bit of cord tied to a nail below it.

THE large Agricultural Hall at Islington, not to be outdone by its larger rival at Kensington with its "Olympia," has been opened under the title of "Arcadia," but though an abundance of flags and streamers, plenty of flowers and shrubs, with Chinese lanterns and coloured gas-lamps by the thousand, have done much to brighten the interior aspect of the hall, it is the Agricultural Hall still. In various parts of the Hall are erected certain wooden platforms, approached by devious inclines as well as by steps. These platforms are in some instances faced or backed by some scene-painter's architecture, *à la* "Old London." As a matter concerning the public safety, we should like to know whether the erection of the platforms and steps referred to has been supervised by any responsible architect or surveyor? The handrails when we visited the hall on Monday last were (some of them) very shaky, while the steps (particularly those at the back of the arches at the Islington Green end of the hall) struck us as being very slight in construction, and quite inadequate to bear the "live loads" that may come upon them on crowded days. It will be well, we think, to look to this before next Bank Holiday, August 1, when no doubt there will be a very large number of visitors to "Arcadia." We cannot say much for the entertainment. What we saw of it was of the ordinary music-hall "variety" type, with a great deal of dangerous gymnastics and profitless contortion of the human body. A feature of the place is the large water-fall at the Liverpool-road end of the hall, immediately under the clock. This has been built by Mr. Dick Radclyffe at a cost, it is stated, of 600*l.* The water for the "fall" is pumped into two large tanks, one on the gallery floor and one above it just below the level of the clock. The effect is very good.

THE Summer Exhibition of water-colours and sketches at the Dudley Gallery is not very much to speak of, but contains some pretty

things. Mr. Arthur Severn has one of his brilliant experiments in colour, "Misty Morning at Sea" (49), with a red sunrise and golden reflections on the waves, represented with a brilliancy which is startling at first sight, but which improves on acquaintance. Architectural subjects are rather numerous. Mr. Harry Goodwin contributes a good study of Boston Tower and Lichfield, and Mr. Medlycott takes Rouen Cathedral and Westminster; in the latter, however (147), the proportions of the Victoria Tower are too broad and stunted. Mr. Newton Benett's Thames scenes (64, 71), are very delicate and refined, if a little wanting in force, and Mr. R. A. K. Marshall, whose name we do not remember, has shown some charming work, minute in detail without losing atmospheric effect, in "Cottages near Chirk" (184) and "The Valley of the Test" (205). Mr. Waterford's "Our Lord among the Doctors in the Temple" (28) would be well suited for a decorative work in mosaic or fresco, for which it is, perhaps, intended. Among other drawings worth picking out are a still-life subject, a study of old books (22), by Mr. Block; "The Edge of the Common" (37), by Mr. P. Ghent, a landscape of much beauty; Mr. Howard Gaye's "Stokesay Castle" (113), a good architectural subject; "The Last Gleam of Sunlight" (137), by Mr. Hiscox,—rather stagy, but powerful; "The Sand-pit" (220), by Mr. Claude Hayes, an unusual drawing in tone and treatment, certainly fine, but looking rather like an attempt to imitate an old water-colour of the pre-chromatic period; Mr. Danford's "A Field Pool" (246), a study of twilight effect; Mr. Franz's "Twilight on the Tiber" (200); Mr. Arthur Severn's "Fir Island, Coniston" (194); and Mr. Dixey's "An East Coast Village" (77), seen dark against the sky from flat marshy land behind it. Mr. J. Knight's large drawing, "The Rock above Lake Idwal" (177), is a grandly-drawn subject, but wholly unreal in colour; the artist's own inventions in colour have run away with him.

PASSING through the Inner Temple the other day, we were moved to turn aside for a few yards to look upon Goldsmith's tomb, which, as many of our readers know, is just to the north of the eastern end of the Temple Church, but outside the churchyard railings, in the midst of a somewhat neglected space or court at present partly used as a stone-yard. The tomb consists of a simple coped stone, inscribed on one side with the words "Here lies Oliver Goldsmith," and on the other with the dates of his birth and death. The coped slab is quite unprotected, and the inscriptions are fast becoming obliterated,—partly by the action of the weather, but partly also (judging from certain scratches on the stone) by the feet of light-hearted juveniles, who perhaps find the tomb a convenient coign of 'vantage for playing at "I'm the King of the Castle." We wonder that something has not long since been done to protect and keep in decent order the grave of the author of "The Vicar of Wakefield."

AT Messrs. Bellman & Ivey's Gallery in Piccadilly is a small but interesting collection of sculpture, including a bronze reduction of the very fine statue of "Diana," by M. Falguière, which was in this year's *Salon*,—one of the most spirited ideals of the goddess of the chase that has been seen. A full-size bronze of the bust is also there; the head is of very original type. Among other interesting works are M. La Vingtre's terra-cotta statuette, "At the Fountain," and some spirited little clay sketches by Mr. Alfred Drury.

THE *Times* has not yet, after the lapse of a week, discovered its blunder about "Mr. Butterworth," in spite of having had a letter with the right name in its own columns in the interim. On Wednesday it printed a letter from Mr. Butterfield, signed with his name, but on Thursday the reporter of the case of the Louth Chapel, in replying to a letter of Mr. Freeman's, thinks better of it, and goes back to "Mr. Butterworth" again. Mr. Freeman, in writing on the subject, said, "he could not find Mr. Butterworth's evidence" in the records of the Fitzalan Chantry case. No wonder.

A VISIT TO THE FORTH BRIDGE.

IN the *Builder* for January 2, 1886, we gave a good many constructional details of the Forth Bridge, as well as a small view of it as it would appear when complete, and an account of the works up to that date. More recently we have published (*Builder*, April 23, 1887) the very full and technical account of the work on the foundations, furnished by Mr. Middleton, the contractor's engineer during that period of the works, to the Civil and Mechanical Engineers' Society. At a future stage of the work we shall probably be able to give further technical details. But these, though of the most value to practical men, do little to give an idea of the real scale of the work which is being carried on at the Firth of Forth, and of the bold nature of the undertaking. Mr. Baker's lecture at the Royal Institution a few weeks back, to which we referred, did something, aided by the fine series of photographs shown by the lantern, to convey an idea of the scale of the bridge to those who have not seen it; but only a visit to the work itself can enable any one to realise the actual bigness of it. Mr. Baker's photographs, however, stimulated the imagination so far as to lead us to the conclusion that life was not worth living without seeing the Forth Bridge, and accordingly we found ourselves not very long afterwards disembarking at the mean-looking little roadside station of Dalmeny, about fifty minutes by rail from Edinburgh and twenty minutes' walk from the head of the bridge works. A few notes of impressions on the spot may assist others who have not been there to understand the real nature of the work, which is unquestionably the boldest engineering undertaking of which we have any record.

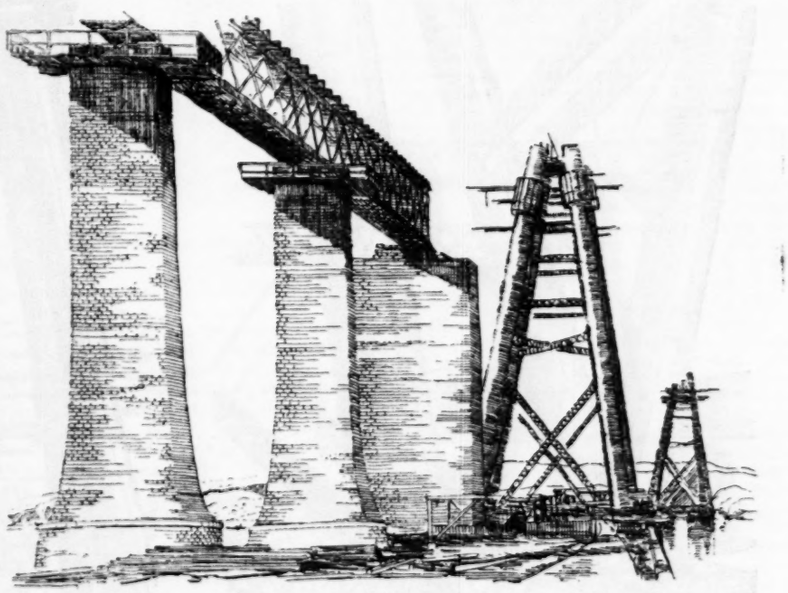


Fig. 1.—*Approach to the Bridge from the Queensferry Side.*

Walking from the station, we come first to the workshops for preparing the various portions of the structure; for everything is set out and made on shore, the plates being afterwards numbered, taken to pieces, to be put together again *in situ*. These work-yards extend for a considerable distance along the southern bank of the Firth, near to, but not close on, the shore, except at the point where the bridge head is reached. At the entrance to the work-yard is the house for the resident staff, and for the accommodation of the chief engineers on their frequent visits. The illusion in regard to scale which meets one throughout the work, and is only gradually dissipated, begins in the work-yards, for the extent of these is so great and the constructions dealt with generally are so large, that it is difficult to realise at first that the portion of one of the large angle tubes for the main piers, which is lying along after being built up, is really 12 ft. in diameter. The upper story of one of the sheds is laid out as an immense drawing loft, all the details of the iron work, after being first drawn to scale on paper, being set out on this floor full-size; and very complicated work some of this detailing must be, considering the number of steel plates of which each portion is built and the accurate fitting required at junctions. The moulding-loft contained, at the time of our visit, an "architectural" model also, of the arch which is to crown the last stone pier before the steel portion of the bridge commences, and through which the railway is to run. This arch, which has to come on the top of the last stone pier shown in our first sketch, is a little larger than the Marble Arch; not, it must be admitted, equal to that in design, but more suitable to the situation. The other sheds are filled with machines for dealing with mild steel in various ways; planing and trimming machines, crawling slowly backwards and forwards along the edge of a plate; circular saws, moving with what seems very slow revolution, but which has been found to be the most effectual in shearing through soft steel; hydraulic presses for giving the requisite curve to the plates, which are placed on a concave bed of the required curve, a convex "squeezer" of the same curve coming down on the plate and settling the job in a moment. Everything is slung and moved by hydraulic cranes; there is no lifting of heavy weights by manual labour. Outside the sheds a travelling drilling machine is working on the plates of a portion of one of the tubes, holes being drilled by hard steel drills working under a jet of water directed on the point; these cut out the mild steel in long thin spiral ribands which strew the ground beneath. In other places the operation of riveting up by a hydraulic riveter was going on; "pretty," as Pepys would have said, to see the red-hot nut of the bolt, at one stroke of the riveter, crushed, cooled, and polished into a smooth semicircular boss, giving a remarkably neat finish to the portion of the riveting which has been thus worked. Hydraulic riveting, however, cannot be applied in all situations.

Going down on to the road skirting the shore, we proceed towards the first, or Queensferry pier, along the temporary bridge and road which have been formed by the side of the stone piers carrying the shore ends of the viaduct. The appearance of things from this point of view is indicated in the first of the sketches appended. On the left are the lofty granite piers carrying the viaduct, and which in themselves constitute what would once have been thought a great engineering work, but which is completely dwarfed by the magnitude of the cantilever portion of the bridge. This dwarfing, however, is not apparent from this point of view. The steel pier does not show its real size any more in the reality than in our sketch; there is nothing to give scale to it, and in perspective it appears close to the last of the stone piers. It is difficult to realise from this point that the structure beyond, now wanting only the top member or crosshead, is 350 ft. high, and that each of the tubes shown is 12 ft.

diameter. (The tubes are a little too thick in proportion in the sketch.) The cylindrical excrescences clinging round the top of each tube are the cages invented by Mr. Arrol, the contractor, for the safety of the men. They are built with vertical bars, with the spaces between filled in with wire netting. The men work inside this, building up the plates, and as the tubular structure progresses, the cage is pushed up in advance of it; so that the tube forms to a great extent its own scaffolding.

Proceeding till we get under the pier, we at last realise the size of the thing we have come to look at. The space included within the four angle piers is quite a large area, crammed, of course, with all the *débris* of builders' operations, while here and there a red flag warns people off places which are dangerous, owing to the chance of falling bodies from work going on above. The angle tubes go up like leaning towers into the air. Above there is a complicated mass of wind-braces, scaffolding, and tackle, which obstructs the view to the top, and this sketch are seen two of Mr. Arrol's "cages" clinging round the tubes. Arrived at the top, we find ourselves on a broad scaffolding covering nearly all the space included between the members of the pier; from this there is a glorious view over the Firth and the adjoining country; and, which is more to the purpose, from this point we can realise better than anywhere else the nature of the undertaking. Let the visitor bear in mind that he is here 350 ft. above sea level, on the top of a construction of immense proportions and enormous weight; let him look out at the next pier, the Inchgarvie pier, a third of a mile off; and let him reflect that from the erection he stands on, a construction equally massive and heavy in its parts, and nearly twice as long, is to be *built out horizontally* into mid-air over the sea, without any possibility of scaffolding, by men working in squirrel cages stuck on to the end of the tubes, and pushed on as the tubes are built, and he will probably agree with us that this is an engineering project calling not only for scientific knowledge and experience, but for no little courage, on the part both of engineer and artisans. A vivid idea is given of the nature of this part of the work by the appearance of the portions of lower members of the cantilevers already finished, as shown in sketch 4, taken from the top of one of the four circular granite piers which form the base of the steel pier. Here the portion of the cantilever tube which is completed is shown projecting out into mid-air like the bowsprit of a huge ship, with the workmen's cage at the end of it; and in that way and by that means it is to be carried on. (At the time of the sketch being taken the cage was not being used, and the netting had been removed, leaving only the frame-work.) The cantilevers at opposite sides of the main pier are, of course, carried on simultaneously, in order to balance each other, and the plan is to commence with the lower member of the cantilever; then to sling it up temporarily and execute an equal length of the top member and the cross braces which connect the two; this section of the cantilever will then be complete and stable in itself, and the next section can be proceeded with in the same manner. The temporary supports for the lower members are in themselves of a tolerably permanent kind, and at the time of our visit temporary "temporary" slings were being adjusted for this purpose, which, it may be mentioned, were formed from some of the links of Old Hammersmith Bridge, which have come in very usefully, and seem to be in very good condition.

We asked one question at headquarters which we thought a crucial one, and the answer to which we promised to keep a secret if desired, viz., how long do the engineers, in their inner conscience, believe that an enormous iron structure like that, with such an outer and inner area of plate surface, will last? Mr. Baker, however, has every faith in it from that point of view; he is of opinion that, properly looked after, there is no reason why it should not stand for 500 years. Provision has been made for getting at every part of it; there are

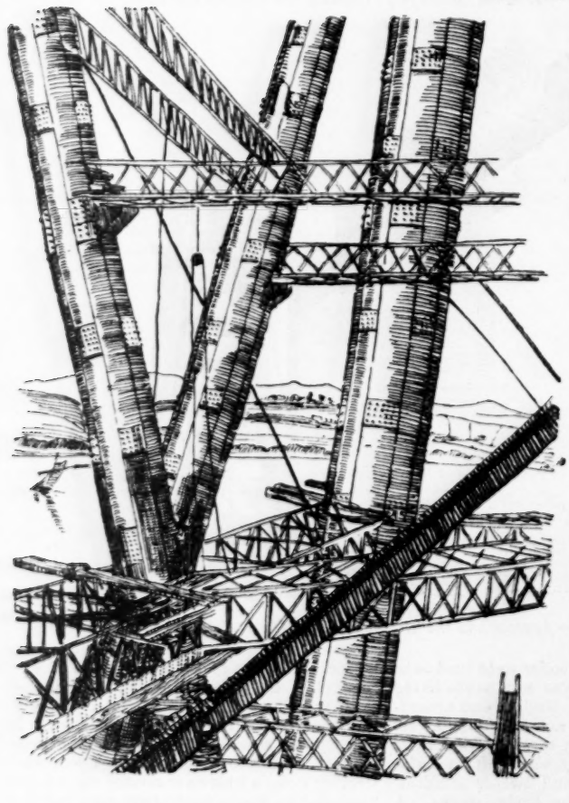


Fig. 2.—Half-way up the Queensferry Pier, showing Main Angle Tube and Cross Braces.

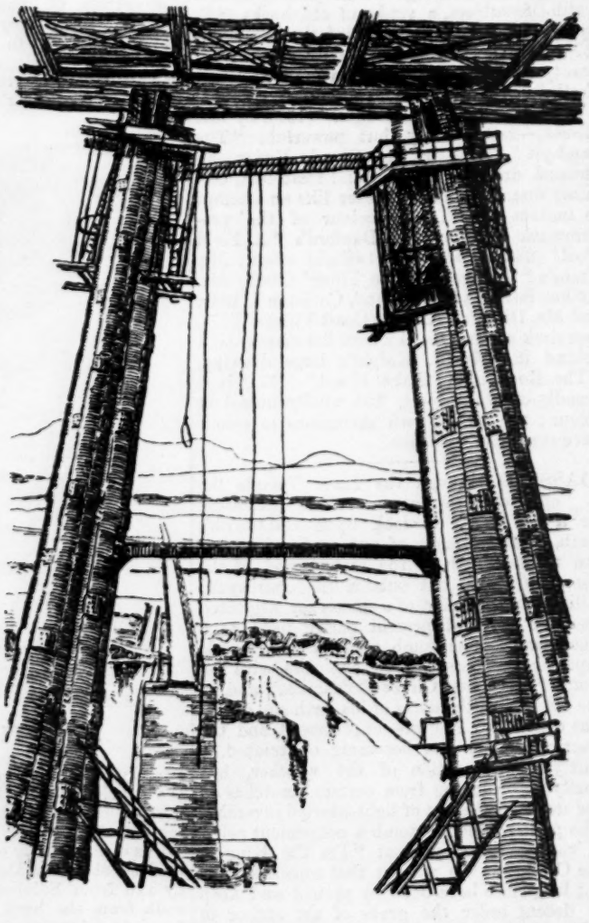


Fig. 3.—Near the Top of the Queensferry Pier, looking down on Masonry Pier and Viaduct.

prevents one taking in the whole. We can go up very expeditiously, however, in one of the two travelling-cages which work with guides on a couple of steel ropes stretched till they are rigid: the cage being drawn up a rope wound by a steam-engine below, and fitted with a patent clip warranted to hold on the guide-ropes if the suspender breaks. The ascent between these vast bones, so to speak, of the structure, is curious and picturesque in effect. In sketches 2 and 3 we give reminiscences of the effect of the structure as seen from two points on the temporary ladders fixed on the wind bracing. They are both looking towards the Queensferry side of the Firth, and will perhaps give some idea of the look of things up here, and the appearance of these great tubular girders soaring up into the air. No. 2 is taken just at the half-way point, where the great cross-braces at the side intersect; No. 3 is about 60 ft. or 70 ft. perhaps from the top, and in this is shown the masonry pier before mentioned, far below, and reduced to very secondary position. At the upper part of manholes in every tube and in the diaphragms throughout them, and steel ladders formed in the interior of the tubes. It is to be hoped air inlets have been provided also; it would be rather a stupid kind of death to be stifled at the top or bottom of a long tube.

The cantilevers are only just commenced; and there is no doubt this is the most difficult and anxious part of the work; but we anticipate its successful accomplishment.

It will, no doubt, be objected by some that the bridge is a very ugly erection; that was our own impression the first time we saw a sketch of the design. But the fact is that you do not feel this after seeing the work itself. It is so immense that it fascinates by its very size, and so difficult an undertaking that one feels that decorative considerations would be out of place; the problem is to do it at all. Every architect who is in the way of doing so should see this extraordinary work. He may not think it beautiful, but he will probably come away with the conviction that Gothic vaults were not such very big things after all.

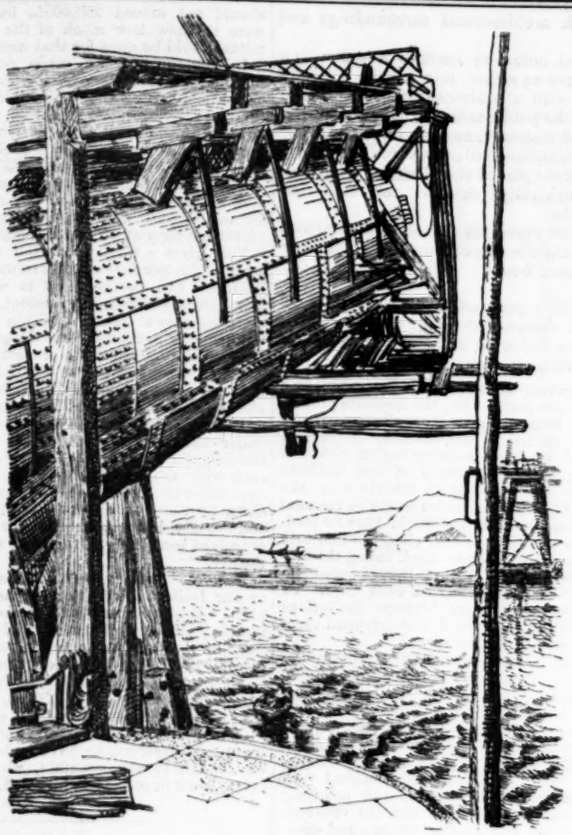


Fig. 4.—The lower member of the Cantilever starting on its journey; Inchgarvie Pier in the distance.

NOTES FROM DURHAM AND AUCKLAND CASTLE.

BISHOP HATFIELD'S magnificent hall at Durham Castle, now the Dining-hall of the University, has recently received the much-needed addition of an oak screen and gallery at the lower end, from the designs of Mr. C. Hodgson Fowler. The rich Renaissance screen erected by Bishop Cosin, during his magnificent tenure of the See (1660-1674), was ruthlessley swept away in 1849, under the iconoclastic rule of Dean Waddington and Archdeacon Thorp, together with the sumptuous mantelpiece and panelling which hid the bareness of the walls. The whole was a gorgeous specimen of its style, with Ionic terms, broken pediments, arabesque escutcheons, and swags of foliage, on every account deserving preservation. Mr. Fowler has, very wisely, not attempted to reproduce Cosin's work, but has formed his design in accordance with the best examples of mediæval hall-screens, the traditional arrangements of which he has carefully followed. The centre is solid, with a sideboard below, and a square projection rising from a curved soffit in the gallery above, and a wide two-leaved door on either side. The front of the gallery and the centre and flanks of the screen are covered with well-designed Perpendicular panelling, in which a little greater depth of moulding and vigour of outline would have given more effectiveness to an excellent work.

The picturesque Ionic porch with which Cosin masked Bishop Hatfield's fourteenth-century arched doorway, from the friable nature of the stone, has gradually fallen into a state of almost dangerous decay. All the four columns are much weather-worn, and one is reduced to such exceeding tenuity that it reminds one of a stick of barley-sugar which a child has vigorously sucked. It is to be hoped that when the needed restoration takes place the old mischievous principle of restoring away Renaissance work, because it is not Gothic, which has swept away so many beautiful and interesting features in the Castle as well as in the Cathedral, will not be revived, but that though Cosin's woodwork is gone,—probably burnt,—Cosin's porch will be allowed still to bear witness to the princely liberality of that great "prince palatine," and that the repair may be done by some sympathetic hand.

The windows of Bishop Tunstall's late but charming little chapel in the Castle cry out loudly for stained glass. The modern panelled desk-fronts assort but poorly, either in colour or design, with the gorgeously rich bench-ends with heavy poppy-heads in black oak bearing Bishop Ruthall's arms (1509-1523), brought from Auckland Castle, or with Cosin's screen and gallery. The walls of the sanctuary are lined with some good examples of "intarsiatura" panelling representing Apostles and Evangelists brought from the cathedral, or some other sacred building.

The original three-aisled Norman chapel of Bishop Walcher (1081-1096), with its tall cylindrical pillars bearing up its vaulted roof, its herring-bone pavement, and raised platform for the three altars, one at the end of each aisle, still serves as the thoroughfare to Salvin's Keep. It is to be wished that so interesting a building were better cared for, and treated with greater reverence.

The newly-erected Lecture-rooms and Examination-halls on the Palace green, both without and within, powerfully recall a second-rate Board school. A more bald uninteresting work we have seldom seen. With such excellent architectural skill at their doors the University authorities have little excuse for giving an illustration of the old saying, "Go further and fare worse." The cold blue slates are so offensive to the eye, and render the lecture-rooms so intolerably hot, that it has been resolved to exchange them for grey Stonesfield slates.

The Chapel of Auckland Castle is receiving a costly process of adornment, at the expense of the present Bishop, whose munificence is as remarkable as his learning, under the general superintendence of Mr. Hodgson Fowler. The total cost will not be much under 4,000*l*. The truth of the tale that this chapel was originally the hall of the Episcopal palace, and was converted to its present use by Bishop Cosin, the former chapels,—there were originally two, one over the other,—having been pulled down by Sir Arthur Haselrigge to erect his mansion, which in its turn was demolished by Cosin, indignant at the sacrilege, which had been doubted by some, on the ground of the ecclesiastical character of the building, and its proper orientation, has been fully substantiated during the progress of the repairs. On lowering the ground at the east end the three archways opening respectively to the buttery, kitchen, and pantry, which are so certain a mark of a Mediæval hall, were discovered built up in the wall, as well as the putlog-holes of the gallery floor, traces of the outside staircase to which, and the door leading to it, are to be seen in the south wall. Though Cosin is accredited with having built the chapel, he did no more than restore a half-ruined building, putting in new windows, and erecting a lofty clearstory and panelled ceiling. The stalls and other furniture, of great richness, are also his work. The arcade of four bays, the arches supported by the "divers pillars of black marble," described by Leland, in "the great haulle" (the same Frosterley marble which gives its character to the chapel of Nine Altars in Durham Cathedral) is of Early English date, but not all of one period, the westernmost piers having the square abacus of the Transitional style. The wall-shafts of the original roof at a lower level, rendered purposeless by the erection of Cosin's lofty clearstory, have had meaning given to them by being made to support angels, with expanded wings, carved in oak.

The chief new feature in the chapel is the lofty panelled oak reredos, in three compartments and two tiers, designed by Mr. Fowler, containing very well executed groups and figures in alto-relievo, the work of Belgian artists. The principal subject is the Crucifixion, occupying the central panel in the upper tier. The other panels contain statues of apostles, martyrs, and local Northumbrian saints,—St. Oswald, St. Hilda, St. Cuthbert, &c. The whole finishes with a projecting concave cornice. Below the reredos, the retable of the altar is formed by a long panel of polished brass, set in Frosterley marble, exhibiting in ten arched compartments the various instruments of the Passion in coloured enamel. The wings of the altar are of hangings of rich stuffs of subdued hues. The three eastern windows contain excellent glass of very pleasing, calm hues, the work of Messrs. Burlison & Grylls, who are also responsible for some other parts of the decoration. The whole of the work of the chapel displays an exquisite feeling for colour, which we have so often to feel the want of in more gorgeous and pretentious works. At each angle of the sacrarium stands a tall brass candlestick on a circular Frosterley marble base. A portion of a black marble altar-slab, retaining two of its five crosses, rescued from base uses in the kitchen, has been appropriately converted into a credence-table. In addition to the ordinary choir-stalls, Cosin erected a range of elbowed stalls along the aisle wall on either side, below the windows, quite up to the east end. The bare space above these has been relieved by a dull-green dado, bearing the arms of the bishops in their proper tinctures. The aisle windows, three on each side, which are now disfigured by a travestie of Cosin's "fret" in cold blue on white glass (the tinctures being really "or on azure"), are to be filled with new glass illustrative of the history of the see of Durham by the same artists who have so successfully executed the east windows. A new canopied stall for the Bishop in the return at the west end shows how fully Mr. Fowler has entered into the feeling of Cosin's Renaissance work. Nothing has as yet been done to the ceiling, which is flat and of panelled wood. It would be improved by being relieved with some gilding and a little colour. The good taste which has ruled the whole work is a guarantee against any of the gaudiness which so often offends us in modern attempts at polychrome.

At Durham Cathedral nothing has been done calling for remark since the restoration of the choir by the late Sir Gilbert Scott, beyond the addition of some stained-glass windows, reflecting great credit on Messrs. Clayton & Bell, by whom the whole series has been executed. Few cathedrals, if any, have been equally fortunate in having all their principal windows filled with glass by the same artists, and on one plan. All the windows are good, but the "Te Deum" window on the south transept and the "Joseph" window in the Chapel of Nine Altars deserve special commendation.

It is to be regretted that the niches of the unique tabernacled Nevile-screen behind the altar still remain vacant. Some little while since there was a proposition to restore the statues which augured well, but though energetically advocated in influential quarters, the decided opposition of some and the lukewarm support of others have, though we hope only for a brief period, suspended the work.

The altar itself has received an appropriate ornament in the shape of a gilt metal altar-cross, designed by Mr. J. B. Clayton, of the firm of Clayton & Bell, and executed by Messrs. Barkentin & Krall. It is the offering of Mrs. Lake, the wife of the present dean, and nine other ladies of the diocese. It is a costly and elaborate work of art, on which the designer has evidently spent thought and pains. But owing to the effect of a full-sized model not having been previously tried, it fails to fill its place adequately. Nothing, we may say, is more deceptive than the dimensions of a large building, and it is impossible for the most accurate eye so to carry away its proportions as to be sure that any new piece of furniture will be in harmony with its surroundings unless an actual experiment is first made. As it is, the Durham cross looks dwarfish,—though not so painfully diminutive as the still more costly altar-cross at Ely,—and for want of being an inch or two higher, the horizontal bar falls in the same line with a string-course of the reredos, and loses distinctness. Common sense so plainly dictates that the effect of such a design should be proved before it is executed that we are surprised that this preliminary step is not more often taken. A bit of planking, or even a piece of mill-board, cut to shape, would be enough to prevent an irremediable error. Mr. Clayton, in his design, has evidently desired to avoid the commonplace, and to make a new departure in altar-crosses. His wish is commendable, but the way he has carried it out is hardly happy. Instead of the usual circular or polygonal base of equal sides, his cross rises from an elongated octagonal podium supporting a little bit of brass panel work pierced with four traceried windows, and terminating in as many pinnacles. The ordinary treatment is to us more pleasing. The lower part of the stem is formed of a cluster of shafts supporting a bold projecting cornice, from which the cross proper rises, connected with the cornice by bold spiral sprays of foliage. The arms, which are not equal, the lower being the longer, end in square medallions set round with "bobs" of rock crystal, which might be well spared, and containing the evangelistic symbols on white metal. The centre is formed by a large rock crystal surrounded with red carnelians. The stem is crocketed, giving it an unhappy resemblance to a fish's backbone, or a sword-fish's snout. The cross would have been more effective if the design had been simpler and its proportions more harmonious. The execution is good. Bishop Cosin's stately Renaissance silver candlesticks are to be brought into keeping with the cross by gilding. The ends of the retable now showing bare bits of deal require concealing by an extension of the hangings.

Illustrations.

COMPETITIVE DESIGNS FOR THE IMPERIAL INSTITUTE.

SINCE last week we have obtained, after a great deal more delay and difficulty than there ought to have been about so simple a matter, the loan of the principal drawings from among the Imperial Institute designs, in order to have them photographed under more favourable conditions. We therefore give the perspective of the fine design by Messrs. Aston Webb and Ingress Bell over again, to a larger size and as an extra illustration, in order to do better justice to it. We also here subjoin the following remarks by the authors on their design, which were sent by them too late for publication in our last:—

"In preparing this design it was considered of first importance to impart as far as possible a monumental character to the building, and by displaying the museum galleries, with a central block for the Institute offices, some expression would be given to the various uses of the building; and in order to prominently connect it with the Queen's reign the main tower was detached and devoted entirely as a personal memorial of the sovereign, in the same way as the Albert Memorial is in Hyde Park.

A round-arch style was selected as giving increased dignity to the buildings, and delicacy and preciousness of enrichment were aimed at by the engrafting on it of Renaissance detail. The building was set back 100 ft. from the road, with a central square for the detached tower, and sunk gardens on either side required by the levels of the ground; the whole being laid out with architectural surroundings and sculpture.

The central entrance leads to a hall with a group of offices on either side for the societies and others, with a staircase to each block; beyond were the public entrance to the museums and the grand staircase, and also the entrance to the great reception-hall; towards the gardens in the quiet were placed the libraries and reading-rooms, centrally situated for both the museum blocks.

Access to the museums for the delivery and removal of exhibits was obtained at either side on the basement level."

We give also a perspective view and plan of the graceful design submitted by Mr. T. G. Jackson. The following extract from his report explains his views in regard to the design:—

"In its general arrangement, the plan falls naturally into two parts,—1st, the Institute proper, and 2nd, the Museum, with its galleries. These two parts, it seems to me, should be distinct, though placed in direct communication with one another; for, while the officials of the Institute would require ready access to the Museum, the Museum and Exhibition galleries would be resorted to by the general public, who would have no business inside the Institute. In my plan, the Institute forms a compact quadrangular block facing the new road, with the Museum behind it, and communicating with it at two points on each floor. To insure ready communication between the various departments of the Institute, I have grouped them in four wings round a central space.

Beyond the entrance-hall is a spacious crush-room, with two large staircases, each 10 ft. wide, leading to the great hall.

The great hall and great conference-room are placed together in continuation of one another, and form a magnificent suite of rooms stretching along the whole north side of the interior quadrangle. These rooms would be handsomely finished with ceilings of ornamental plaster and oak panelling part of the way up the walls, and the vestibule would be decorated with marble columns and door-cases, mosaic floors, and moulded plaster ceilings.

The library occupies the first floor in the right-hand part of the front, and the various reading-rooms are placed in contiguity with it.

The rooms for the Royal Colonial Institute and Royal Asiatic Society look to the front, and occupy the first and second floors in the left-hand wing.

The sample rooms occupy the ground-floor under the great hall, and are lighted by large windows with a north aspect.

The museum and exhibition galleries are arranged round a series of courts on the northern side of the site behind the institute proper. In the centre is a great quadrangle, of which the back of the institute forms one side, and in the buildings forming the other three sides I should propose to place the museum of permanent exhibits.

Architectural Design.—It has been somewhat difficult to decide how to design a building standing about half-way between objects so diverse as the huge mass of the Albert Hall on one hand, and the group of Mr. Waterhouse's lofty towers on the other. The main building cannot conveniently be very lofty, and certainly cannot be made to bear comparison with the huge bulk of the Albert Hall. I therefore thought it best to interpose my great quadrangle and museums, which, though they might not entirely hide the Albert Hall, would have the effect of dividing the two buildings distinctly from one another.

The best way, in my opinion, of giving proper dignity to the Institute is to crown it with a lofty tower, which is of itself a monumental and appropriate feature. I have therefore made the central feature of my design a great tower, 48 ft. square at the base, which rises to the height of 300 ft. The upper part would contain a clock, and might be furnished with a carillon of bells.

The building is designed to be of red brick with dressings of Portland stone. The style is that of the Early Renaissance of the beginning of the seventeenth century.

Estimating the main building at 1s. per cubic foot, the tower at 1s. 6d., and the museum surrounding the great quadrangle at 9d., the Institute, exclusive of the additional exhibitions, would cost under 250,000*l.*, the sum to which the competing architects were limited."

We give also this week the perspective view, section, and plan of the design by Messrs. Deane & Son, of which we have already spoken as in its main idea the most suitable and monumental of all. Messrs. Deane & Son write:—

"In preparing our design we have had principally before our minds the greatness of the occasion, and we consider that cost in reason should be no hindrance to the carrying out of such a work, which is to be for ever a monument of the greatness of England and her Colonies, and a worthy memorial also of the Jubilee of Queen Victoria; and we were encouraged in the belief (that the cost would not be a hindrance), by the instructions given by the committee, which stated that at present the cost should not exceed 250,000*l.*, but that architects were to show how much of the design they submitted could be done for that amount.

In consequence, we made our design (which included far more accommodation than we were asked for), hoping that we should have an opportunity of giving an explanation, and pointing out where we could modify our design,—or rather what portions, for the present, we should propose to omit if it was found to exceed 250,000*l.*

We have had an estimate given to us by Messrs. J. & W. Beckett, of Dublin, who are the contractors for our Science and Art Museum and National Library, a copy of which we enclose.

This gives a total estimated cost of 347,127*l.*, equal to 9d. per foot cube all round, including steps, landings, and portico, and it will be seen that although it exceeds the amount, yet it would be perfectly easy to bring it within the cost, without permanently mutilating the design or reducing the accommodation below the present requirements.

We think, however, as we did from the first, that our design falls short of what is due to the occasion, and we should like to have seen it a work of such a character as the Romans would have done under the circumstances, with open courts for statuary and fountains, and with detached buildings, each with a distinct object; but it was utterly impossible to do this, and we were too much tied down by the instructions (sketchy as they were), and the site, but in a small way we thought we had conceived something of the right sort in our amphitheatre.

Nobody, however, seems to have understood it or our feeling about it or the necessity of such a place. It would have been perfectly splendid surrounded with marble statues, and from a utilitarian point of view easily convertible into a huge hall for exhibitions such as periodically occur. We appear to have been the only architects in the competition who completed the whole scheme, showing sections and back elevations of future extension (part of which was the amphitheatre), and we fear we were supposed, therefore, to have included all the work we showed in our estimate, whereas we left all future work in outline as directed."*

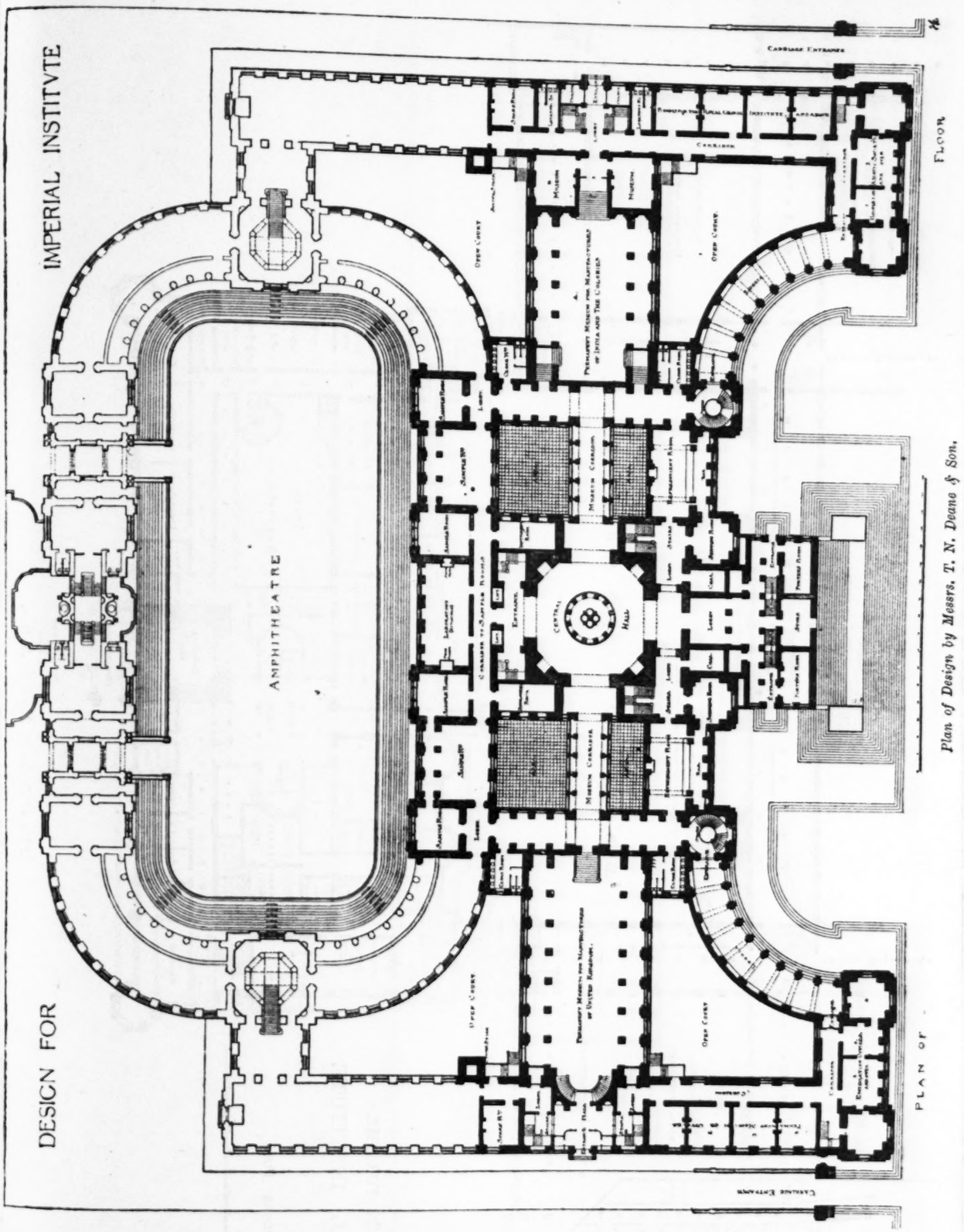
SELECTED DESIGN FOR EDINBURGH PUBLIC LIBRARY.

THE site upon which this building is about to be erected is a peculiar one, in respect that the two streets which form its east and south boundaries are at different levels, and, as its name implies, George IV. Bridge crosses the Cowgate, at a height of 48 feet above the level of that street. The adjoining buildings to the north are of great height, and the difficulty had to be overcome of covering up the rough mutual gable, and at the same time leaving an area for access and light next the bridge. This has been done by projecting the principal staircase forward to the building line of the adjoining tenement, while keeping the main part of the building 10 feet back from the parapet of the bridge.

The *motif* of the design of the building is to secure abundance of light equally on all four sides of the three large rooms—the general reading room, the lending library, and the reference library. This has been attained by the adoption of the cruciform plan. The arms are short in length, and the whole end of each arm is occupied with large windows, so that ample light in every direction is obtained. The four angles which fill up the space between the cross form and the square outline of the site are occupied respectively with the public staircase from the Cowgate to the libraries, service stair, and rooms for staff, book stores, and grand staircase to reference library.

The principal entrance is on the level of George IV. Bridge, giving access to a columned vestibule, at one end of which is the stair up to the reference room, and at the other the stair *down* to the general reading room. In the centre of the vestibule and directly opposite the main entrance are the doors to the lending library, which is disposed in much the same way as the telling room of a bank, the work to be performed being much the same in both cases. The centre area formed by the intersection of the arms of the cross is given up to the public, and is surrounded by the service counter, over which the books will pass between the public and the attendants. The book-shelves will be principally at right angles to the windows, for good lighting, and are so arranged that every book can be reached without the aid of steps or ladders, and are within a pace or two of the attendants' place at the counter. To the right and left of the doorway

* This was quite obvious in the drawings.—ED.



are the catalogues, while indicators placed at each section will inform readers whether the books they wish are in or not. The shelving in this room and the adjacent book store will accommodate 53,450 volumes, calculated at 10 volumes to each square foot of vertical shelf elevation.

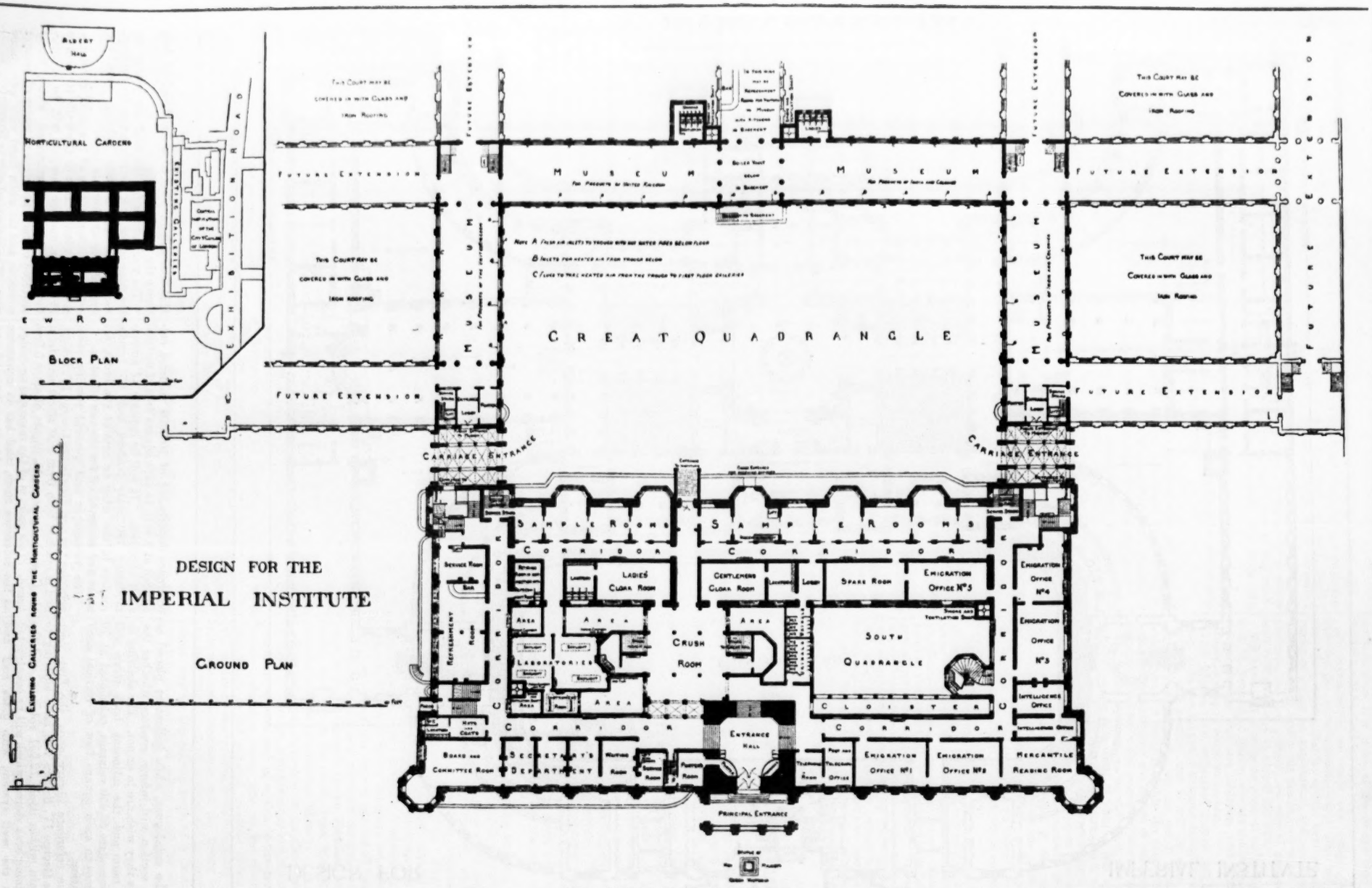
The reference library upon the first floor above George IV. Bridge will have shelving to contain within itself 72,651 volumes, and the adjoining book store—which will be constructed upon the well system, with glass roof and sparred iron floors at 8 feet heights—will contain 35,253 volumes, giving a total for the reference department of 107,904 volumes, calculated at 8 vols. to each square foot of vertical shelf elevation. It will be capable of accommodating 160 male readers, and 36 female readers in the wing or arm of the cross, set apart and screened off for the use of ladies.

The newspaper and general reading room occupies the first floor below George IV. Bridge, and is reached both from that street and from the Cowgate by straight flights of steps 6 feet broad. This room is of the same size and shape as the reference room, and has in connexion with it a separate room for juveniles, and one for the higher-class magazines. The walls upon this floor will be tiled to a height of 12 feet above the floor.

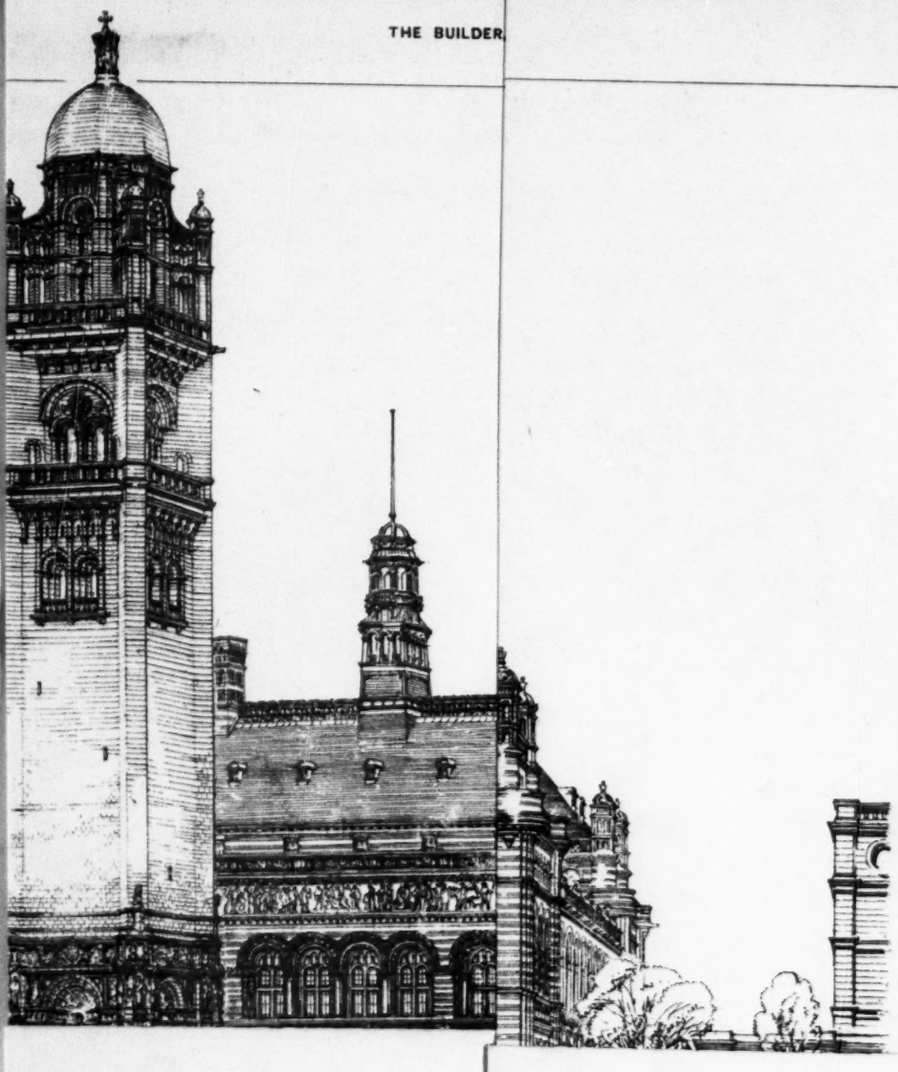
The work-rooms for the staff are placed on the floor below, and the machinery for heating, ventilating, and electric lighting upon the ground floor or Cowgate level.

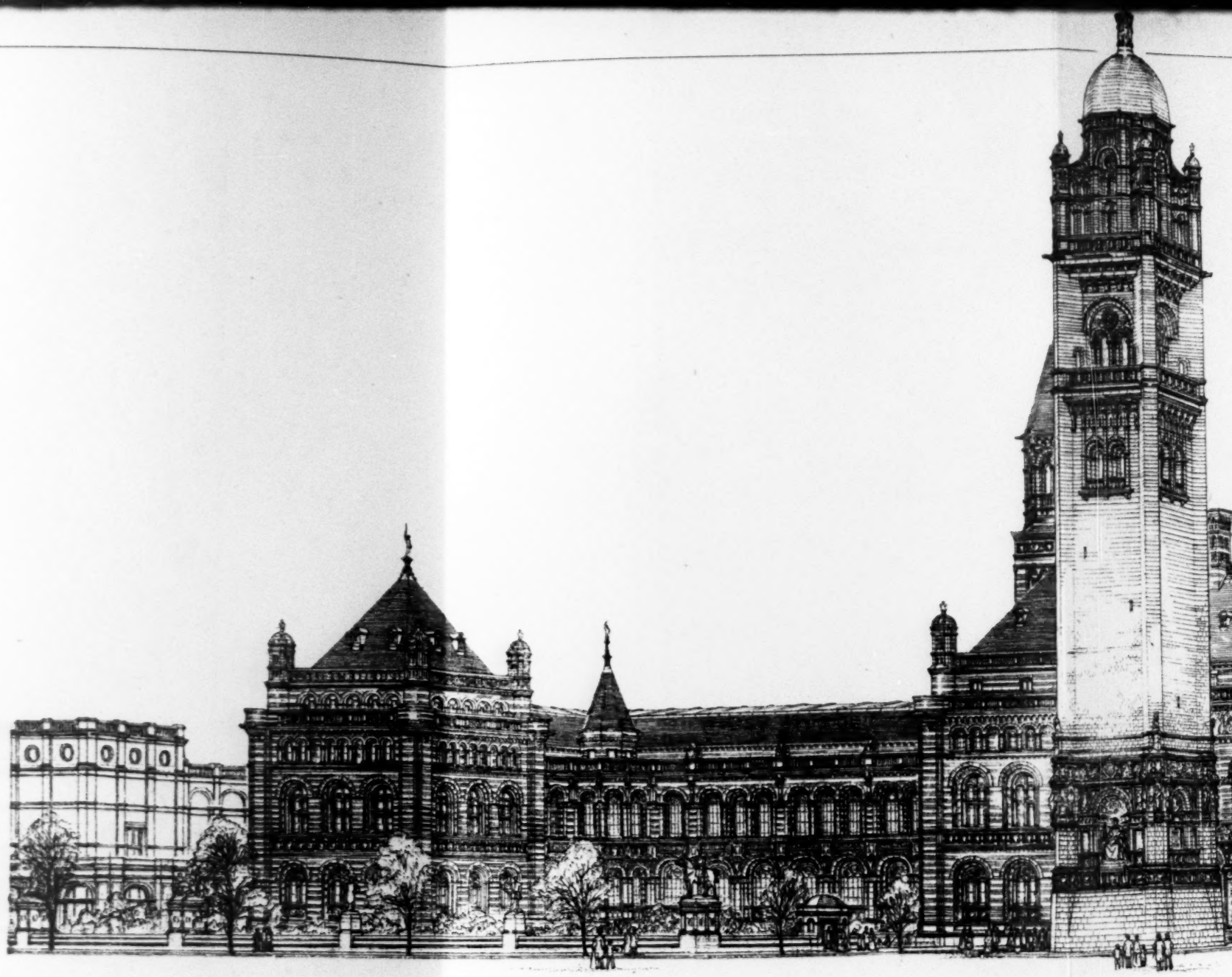
The building will be of fire-proof construction; the external face of the walls to George IV. Bridge, and the Cowgate will be of Stirlingshire or Northumberland stone, finely scabbled on face, the steps of stairs of cement concrete, and the walls lined with well-glazed tiles. The estimated cost is 30,000*l*.

The architect is Mr. G. Washington Browne.

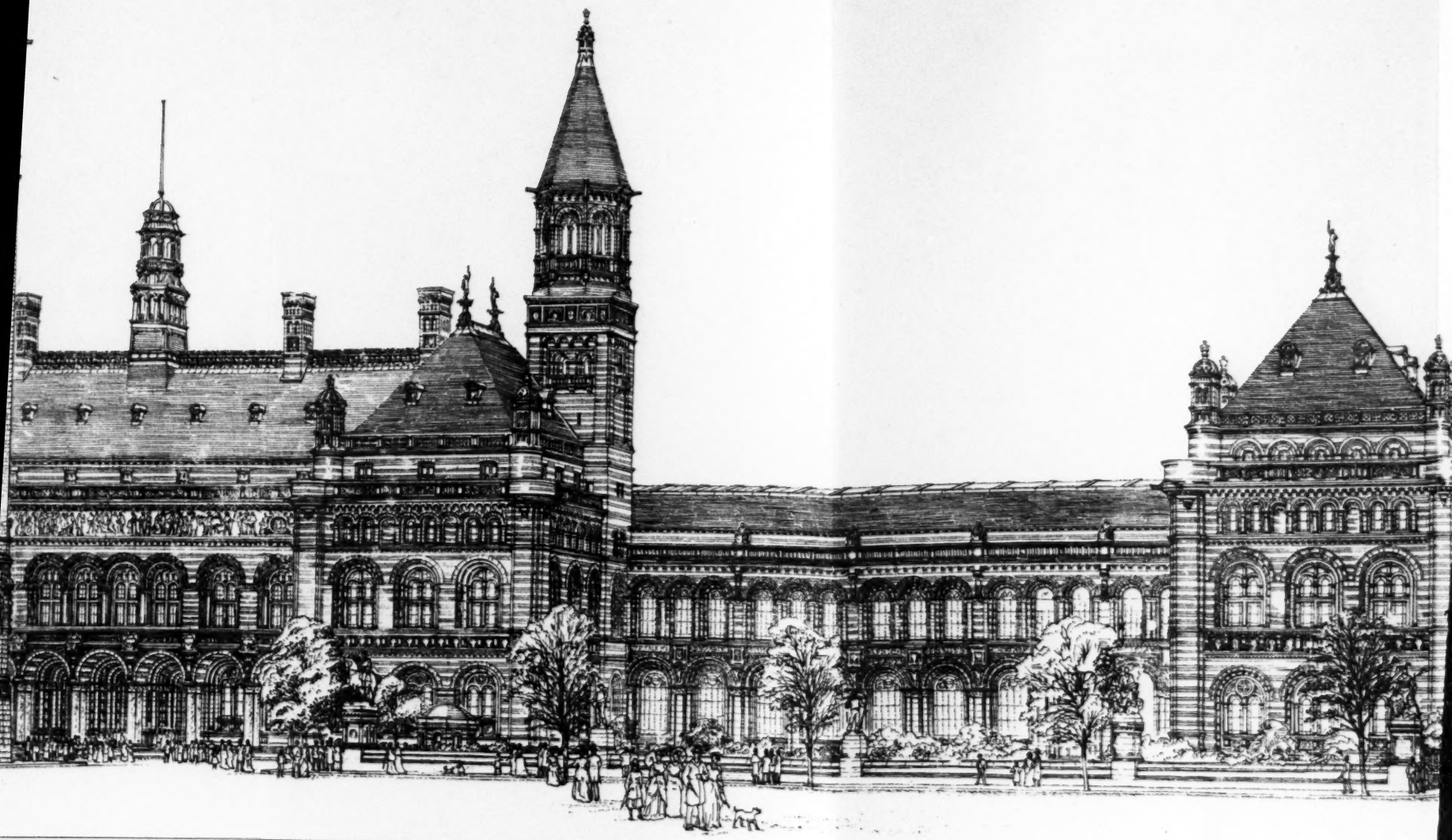


Plan of Design by Mr. T. G. Jackson.



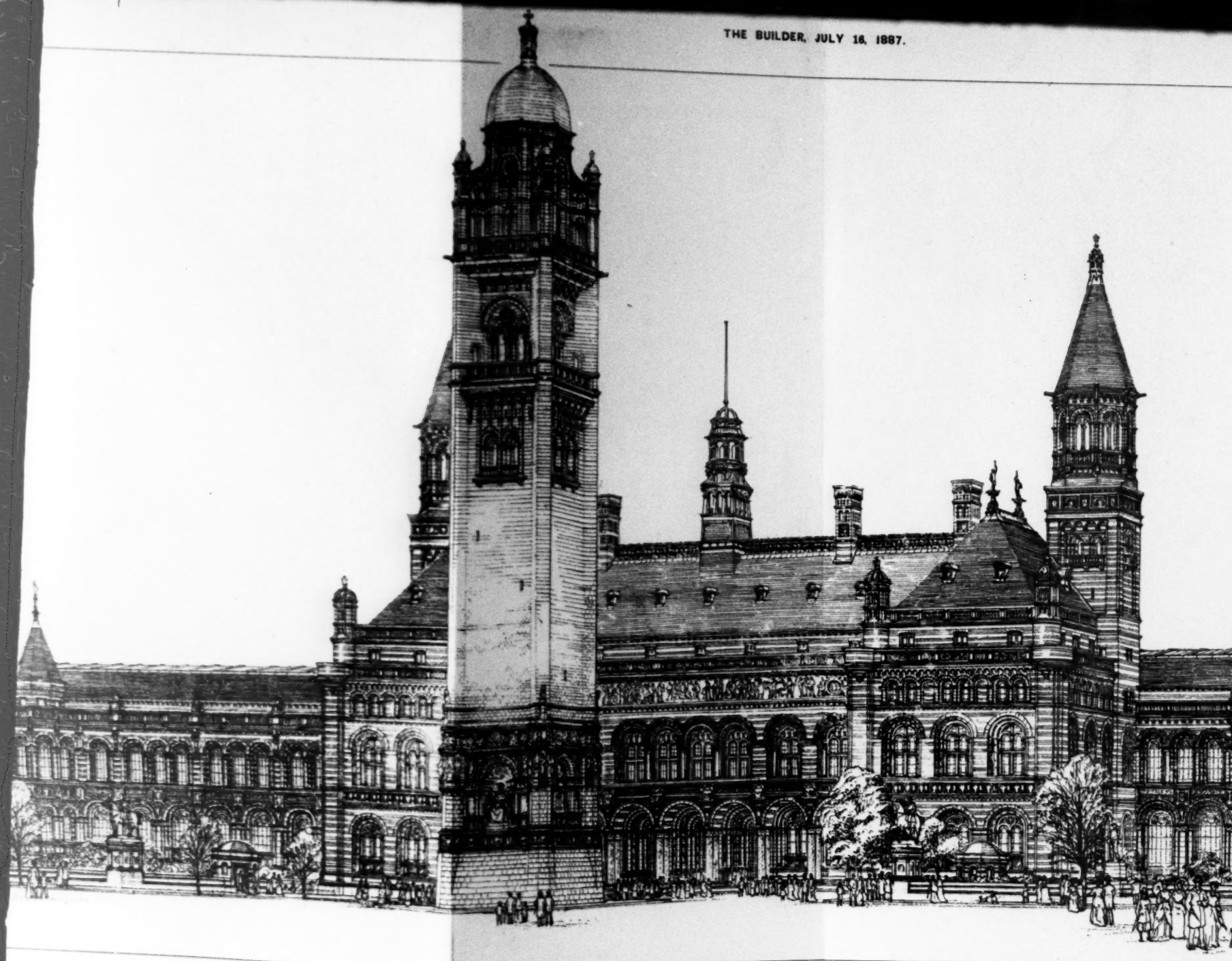


DESIGN BY M



MR. ASTON WEBB, F.R.I.B.A., AND MR. E. INGRESS BELL, F.R.I.B.A.

PERSPECTIVE VIEW (REPUBLISHED.)



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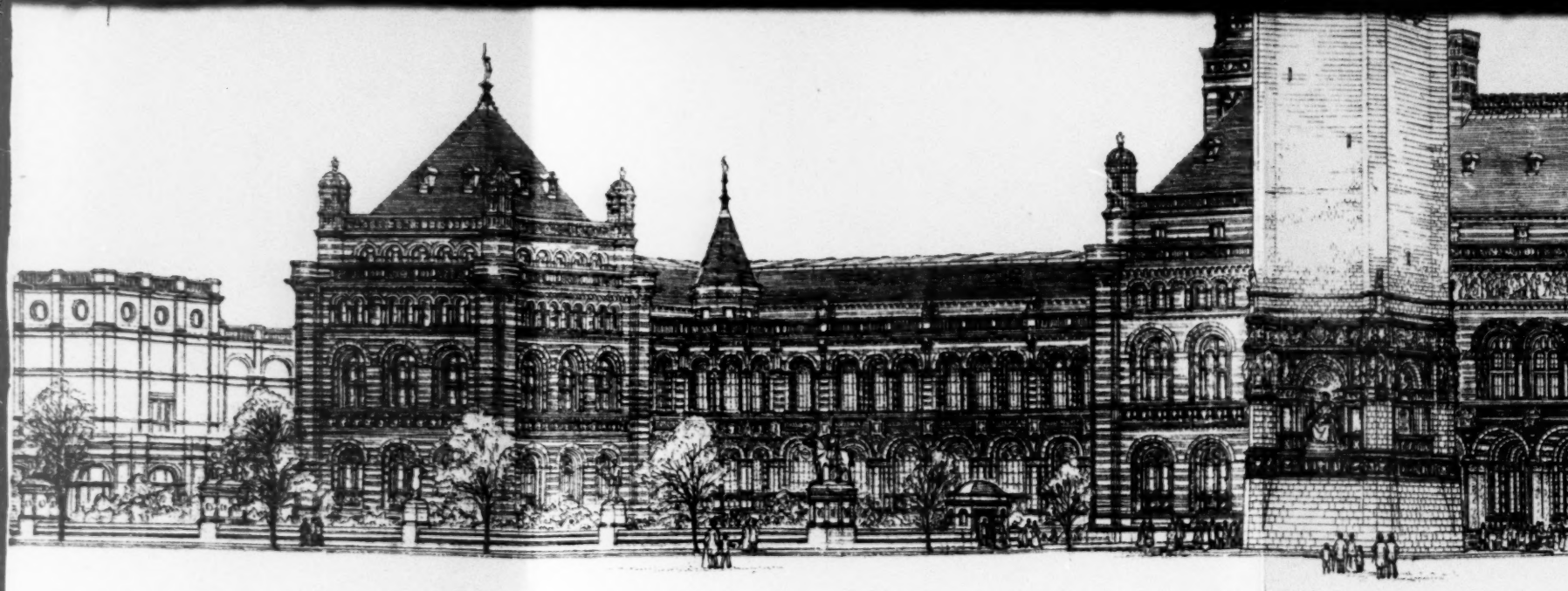
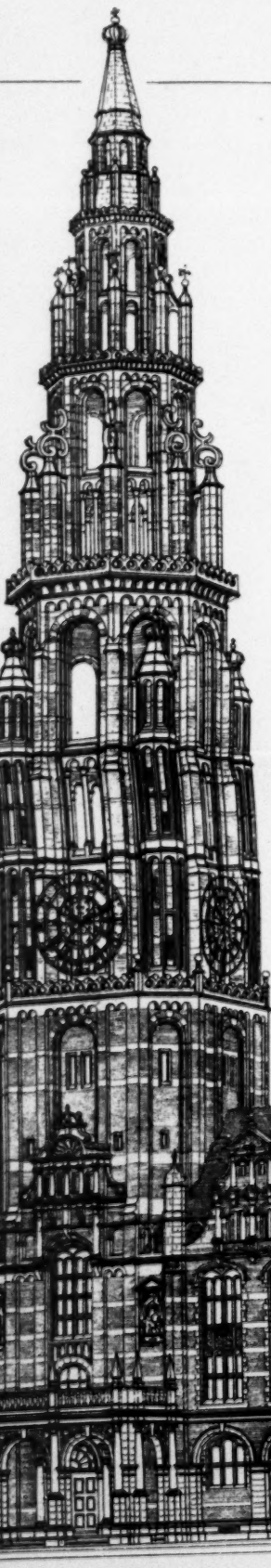
PERSPECTIVE VIEW (REPUBLISHED.)

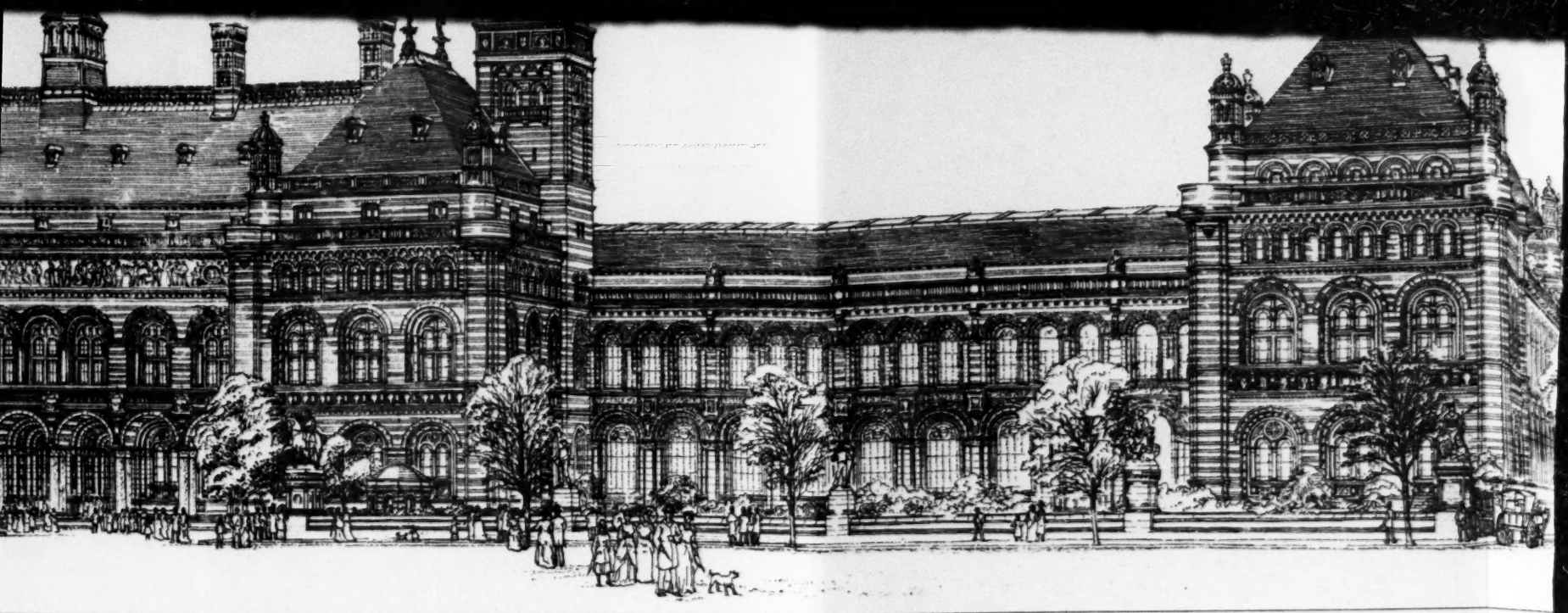
PHOTO-LITHO., SPRAGUE & Co., 28, MARTINS LANE, CANNON ST., LONDON, E.C.



DESIGN BY Mr. ASTON



COMPETITIVE



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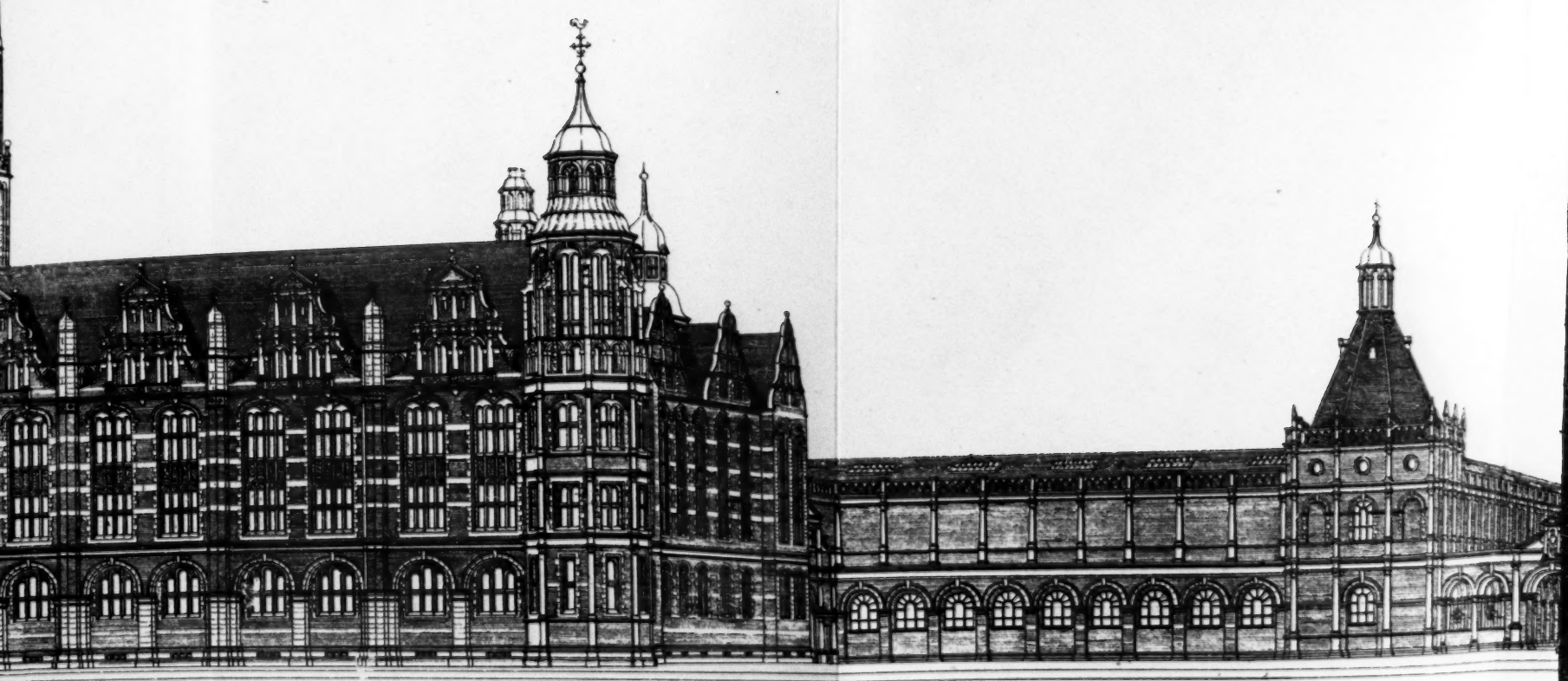
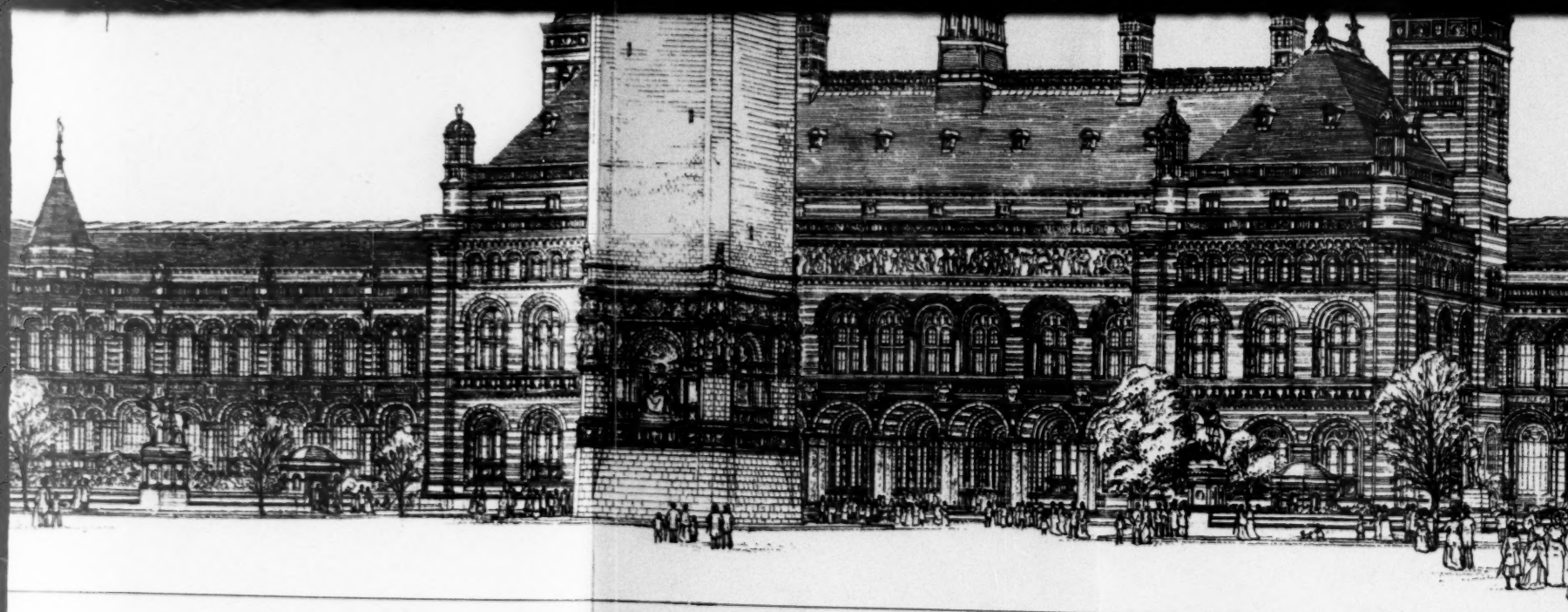


DESIGN BY MR. T. G. JACKSON.

PERSPECTIVE VIEW.

DESIGNS FOR THE IMPERIAL INSTITUTE.



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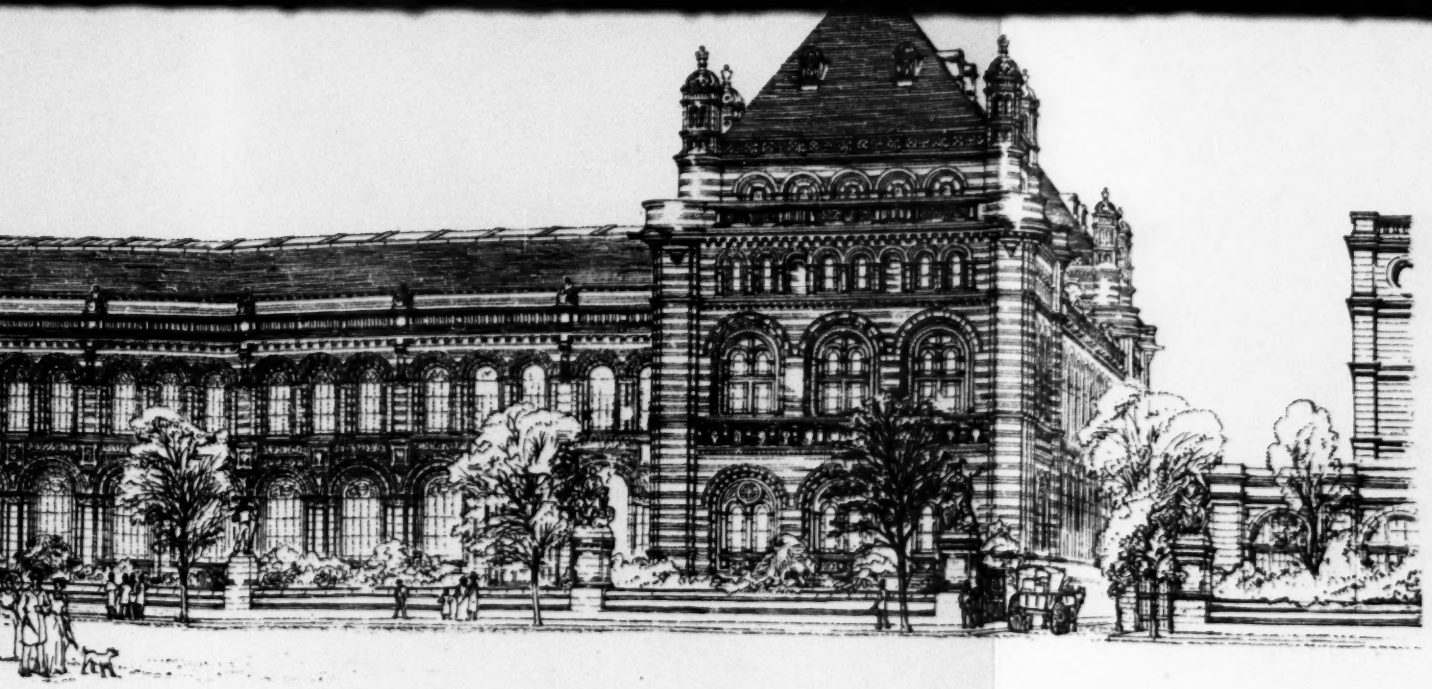


PHOTO-LITHO. SPRAGUE & Co. 28, MARTINS LANE, CANNON ST. LONDON, E.C.

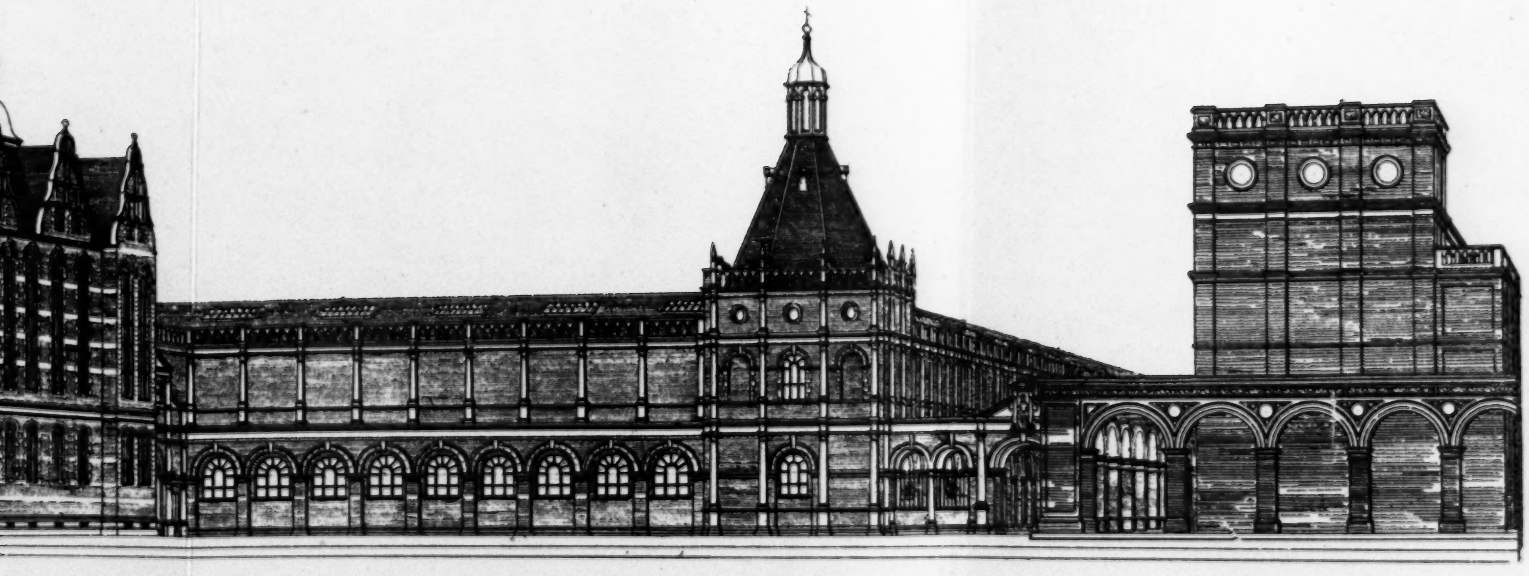
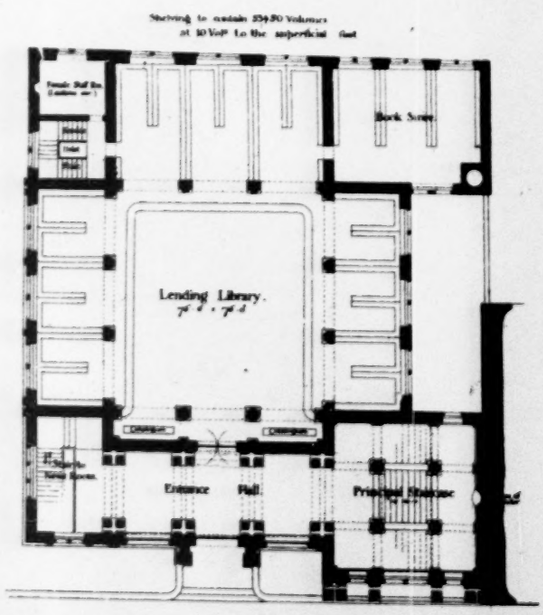
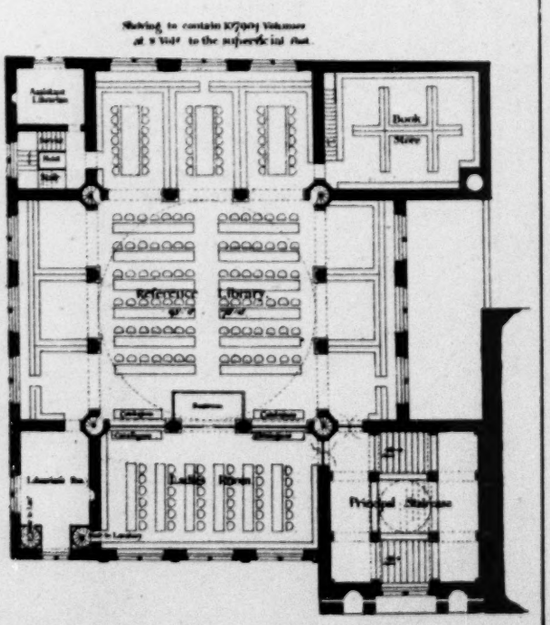


PHOTO-LITHO. SPRAGUE & Co. 28, MARTINS LANE, CANNON ST. LONDON, E.C.

Elevation to George IV Bridge.



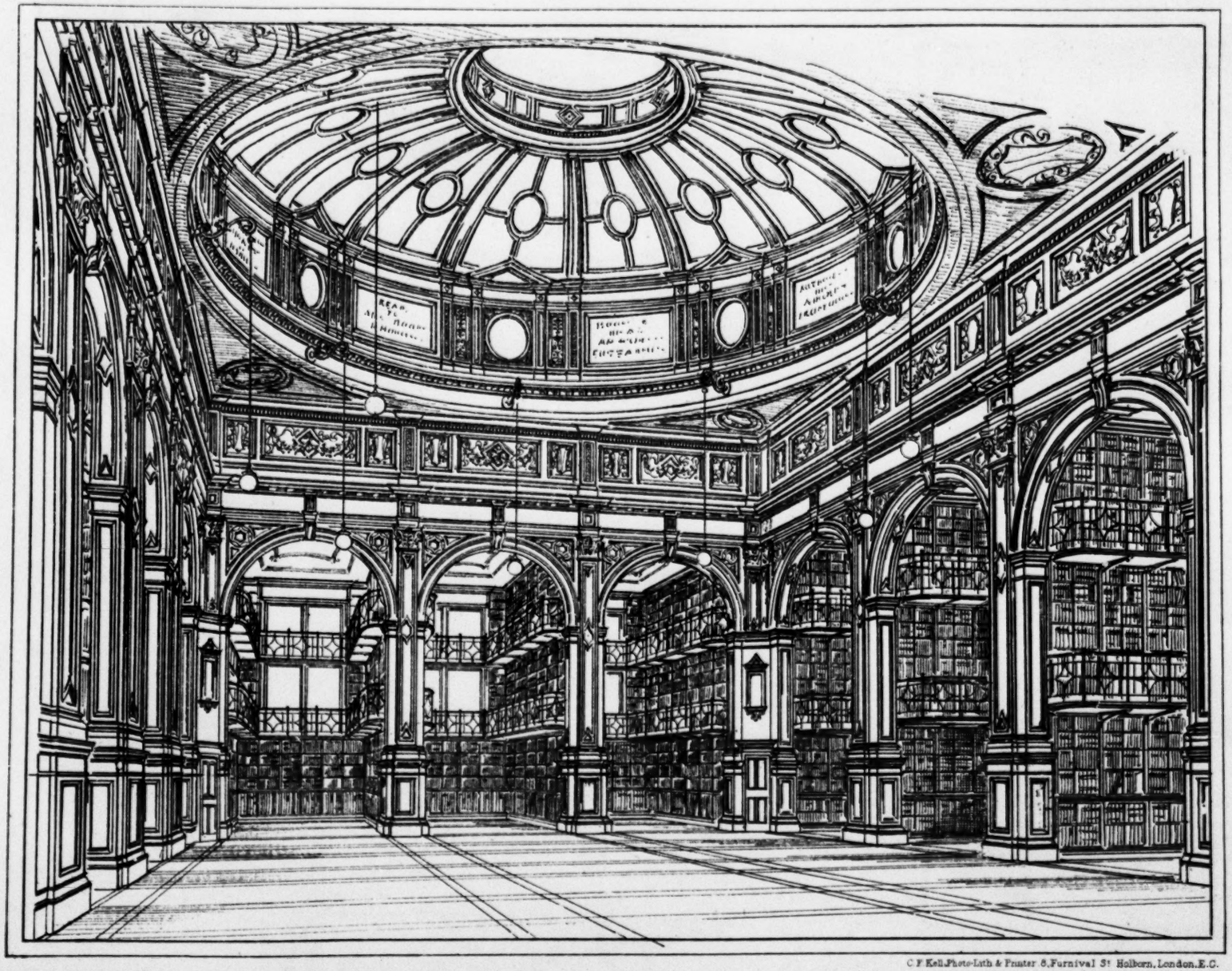
Plan of Third Floor.



Plan of Fourth Floor.

C.F. Kell Photo-Lith & Printer 8, Furnival St Holborn, London, E.C.

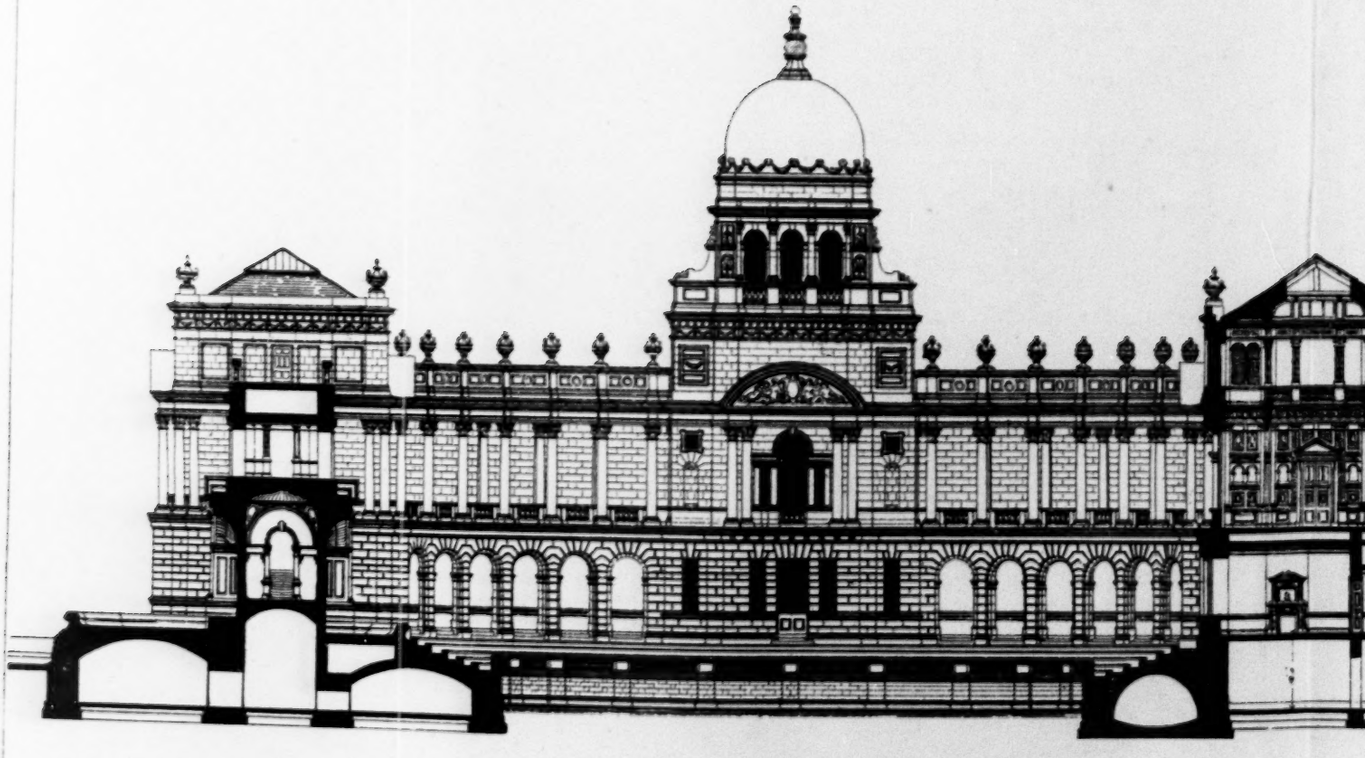
SELECTED DESIGN FOR EDINBURGH PUBLIC LIBRARY.—Mr. George Washington Browne, Architect.



C F Kell, Photo-Lith & Printer 8, Furnival St Holborn, London, E.C.

SELECTED DESIGN FOR EDINBURGH PUBLIC LIBRARY.—Mr. George Washington Browne, Architect.

INTERIOR OF REFERENCE LIBRARY.



TRANSVER

SCALE

COMPETITIVE DESIGNS FOR T

DESIGN BY MESSRS. T.

TRANSVERSE

VERSE SECTION.

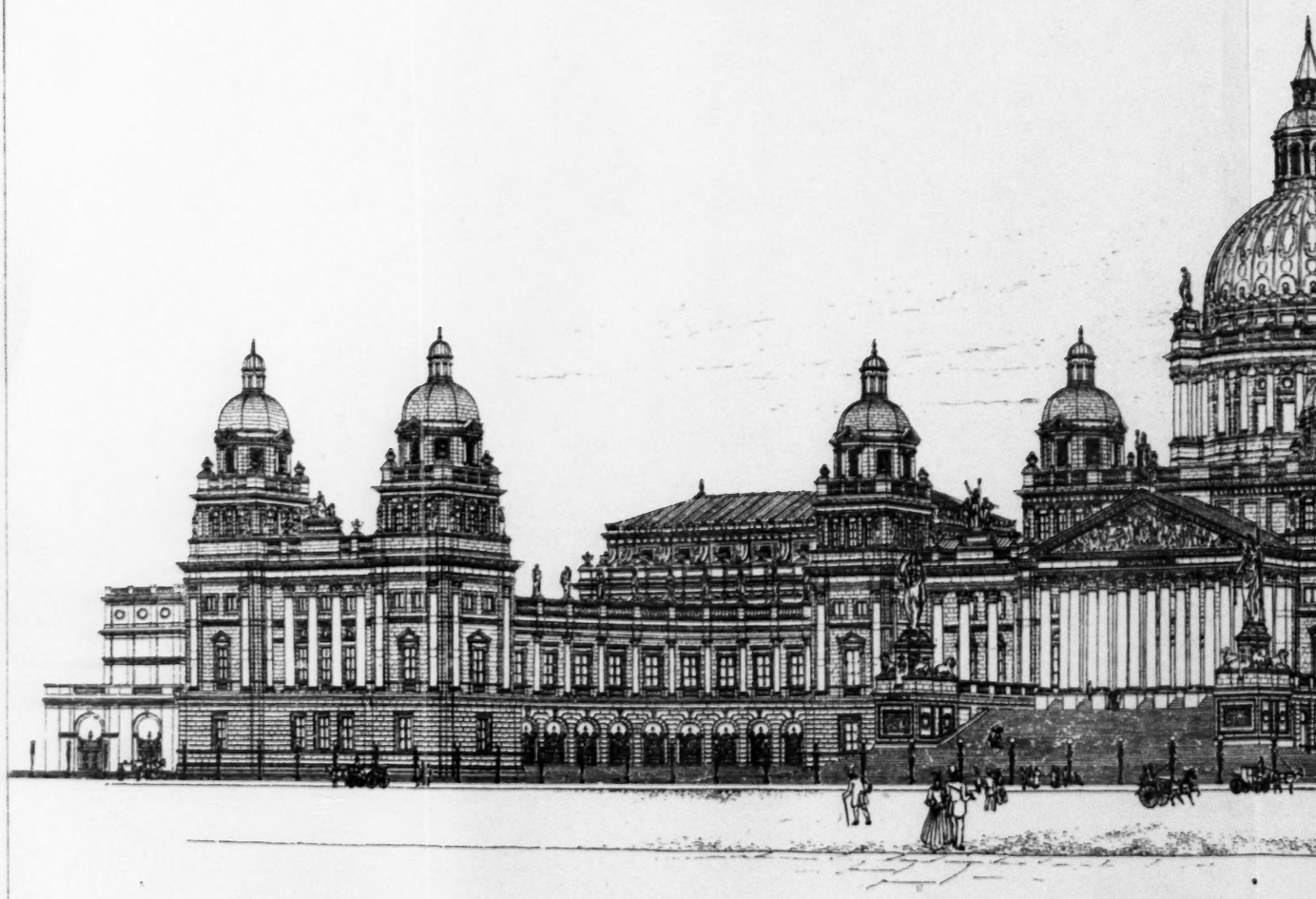
CALE OF FEET.

PHOTO-LITHO. SPRAGUE & Co., 28, MARTINS LANE, CANNON ST. LONDON, E.C.

OR THE IMPERIAL INSTITUTE.

RS. T. N. DEANE & SON.

ERSE SECTION.



COMPETITIVE DESIGNS FOR THE

DESIGN BY MESSRS. T. N.

PERSPECTIVE VI

Thos. Newenham Deane R.H.A
Thos Manly Deane B.A.
Dublin May 1887

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THE IMPERIAL INSTITUTE.

. N. DEANE & SON.

VE VIEW.

THE BRITISH SCHOOL AT ATHENS.

As we briefly mentioned in our last (p. 57), the first annual meeting of the subscribers to the British School at Athens was held on the 6th inst. The Earl of Carnarvon was in the chair, and there were present, among other ladies and gentlemen, Sir C. T. Newton, Professor Jebb, the Earl of Morley, the Rev. Charles Evans, Sir F. Pollock, Mr. E. A. Bond, Mr. G. Godwin, Mr. Watkiss Lloyd, Professor Percy Gardner, Mr. Walter Leaf, and the secretary, Mr. George A. Macmillan. Letters of apology for non-attendance were read from M. Gennadius, the Greek Minister, the Bishop of Durham, Sir Frederic Leighton, P.R.A., the Provost and the Head Master of Eton, and the Dean of St. Paul's.

The Secretary, Mr. George A. Macmillan, read the report, of which the following are the most important passages:—

At the last meeting, on October 19, 1886, it was announced that the school building* was complete, and that a very competent Director had been found for the first year in the person of Mr. F. C. Penrose. It was further stated that an income of 400*l.* a year had been provisionally secured for three years. Mr. Penrose went out to Athens early in November, and about the middle of December Mr. Ernest Gardner, Fellow of Gonville and Caius College, Cambridge, and now Craven University student, was admitted as the first student of the school. Two months later the Oxford Craven Fellow, Mr. David G. Hogarth, of Magdalen College, was admitted. Later in the session two more students, Mr. O. J. Jasonides, of Athens, and Mr. Rupert Clarke, of Exeter College, Oxford, were added to the number. In accordance with the rules drawn up by the committee, Mr. Penrose, besides directing the work of the students, has delivered three public lectures on the Parthenon, the Erechtheum, and the Temple of Olympian Zeus (see *Athenæum*, May 7, 1887), and will deliver three more in the course of October before he lays down his office. He has, moreover, at the expense of the Dilettanti Society, conducted excavations on the site of the Temple of Olympian Zeus at Athens, which have established the important fact that the temple was octastyle, not decastyle, as has hitherto been generally supposed. Before closing this brief record of the first year's work of the School, mention must be made of the very cordial welcome given to the Director and students of the British School both by the native Greek archæologists and by the members of other foreign institutes. Special mention is due of the extreme friendliness of the relations between the British and American Schools. The American Director and students did their utmost to smooth the way for their English colleagues, generously throwing open their excellent library. Representatives of the British School were present at the laying of the corner-stone of the American School building, which is now in course of erection on the adjoining site. The two properties have been surrounded by a single fence at the joint cost of the schools, and will, it is hoped, be to a certain extent enjoyed in common. It is obvious that for the work of a school at Athens one indispensable requirement is a good library of archæological and classical books. The committee are happy to be able to state that a very good beginning has been made in this direction during the first year. In the first place, valuable gifts of books have been received from the delegates of the Oxford University Press, from the Syndics of the Cambridge Press, and from many private publishers, including Messrs. R. Bentley & Son, Messrs. George Bell & Son, Messrs. Macmillan & Co., Mr. John Murray, Messrs. Kegan Paul, Trench, & Co., and Messrs. Calvary, of Berlin. Mr. F. F. Tuckett, Mr. Barclay Head, and other private individuals have also made valuable gifts to the library, and it is hoped that their example may be widely followed. In the next place, the committee have expended a sum not far short of 250*l.* upon the purchase of the books which it was considered most important for the School to possess. Turning to the financial position of the School, the managing committee regret to say that the appeals for aid made for last year after the meeting of subscribers in October did not produce very much result. The new donations amounted to no more than 115*l.*; new annual subscriptions were promised to the amount of 70*l.* 15*s.* a year. Donations towards the establishment of a capital fund or annual subscriptions will be gladly received by the hon. treasurer, Mr. Walter Leaf, Old Change, E.C. Finances apart, the committee feel that there is every cause for satisfaction in the progress made by the School in this, the first year of its existence; and the outlook for the future is no less promising. As Mr. Penrose's successor the committee have been fortunate in securing, for two years, at any rate, the services of Mr. Ernest Gardner, who is a thoroughly trained archæologist, and has had the great advantage of working under Mr. Penrose as a student during the past season, so that he will take up the work with full knowledge of what is required. It is proposed next session to provide board and lodgings at a moderate rate in the school building for a limited number of students. Information upon this point may be obtained from the hon. secretary, Mr. George Macmillan, 29, Bedford-street, Covent Garden, W.C., to whom all applications for admission to the school should be addressed.

* We gave plans, view, and description of the building, of which Mr. Penrose was the architect, in the *Builder* for Nov. 20, 1886.

The Chairman, in moving the adoption of the report, said:—Ladies and Gentlemen,—Every one will have heard with great interest the report which has just been read. There was not a word which could be spared. But I think if I summed up the general purport of it, I might say, in a few words, that although much has been done, a great deal more remains to do. Like many other reports, it is of a mixed character,—there is good, there is evil in it. Still I think this annual meeting may congratulate themselves upon the large stride which has been taken in the cause in which we are all interested. It was launched under every good augury, and those of us who a few years ago were present at the meeting in Marlborough House under the presidency of the Prince of Wales will feel that the work has in a great measure responded to the anticipations of that time. At that meeting were men eminent in literature, in art, in science, in politics, in classical learning, and in society. Since that meeting the Greek Government gave us very generously a piece of land; a temporary endowment for the brief space of three years was provided; our house has been built, our library, as the report tells us, has been founded, and amid the help of our American friends and the generous rivalry of French and German students our work has been commenced, lectures have been inaugurated, students have been admitted, and under the teaching and training of Mr. Penrose, to whom we owe so deep a debt of gratitude, the undertaking has been fairly and fully launched. One thing, and one thing only, seems to be wanted,—money comes but slowly in. But I must say when I look to the nature of the work and to its probable results I marvel that there should not be found men throughout the length and breadth of this country who possess great personal and private means who are willing to identify themselves with this most remarkable movement, and to be associated for all time with the British School at Athens. I sigh to think that we cannot find some Mæcenas or Herodes Atticus who might gain glory by connecting his name and reputation with such a work. I assume, of course, that we all agree on the value of such a school as this. I do not appeal to the dull ears of those who have no sympathy with the teaching of Greek in the curriculum of the highest English education. I assume that we all agree that the life and literature of the ancient,—and particularly of the Greek,—world, lie at the root of our highest education in England, and if that be the case then I think there is ample reason and advantage in such a school as that which we have recently founded at Athens. And for these two good reasons: first of all, that Greek and Latin archæology, but especially Greek, has been admitted within the circle of our Classical teaching. It was not always so, but the more we accept the doctrine, which is the true doctrine, that history is not entirely comprised of battles and sieges, and the biographical events of individual lives, but comprehends the whole existence and movement and progress of nations, the more we must recognise Archæology as a very essential element in History. She is, if not in fact History, the handmaid of History. In the second place, there can be no better place in which to study the Greek archæology than Athens. There is a *genius loci*, as it has been called for want of a better word, that sort of subtle atmosphere which arises on the spot, the presence and influence which gives interpretation, so to say, to passages which would otherwise be obscure and reality to facts which it would otherwise be hard to realise. All this we get by actual study on the spot. And he must be very cold and hard, very dull of apprehension, who can stand on that ground and not feel keenly at the sight of places where Pericles spoke, where Æschylus sang, where Aristophanes joked, and where St. Paul preached. As I take it, from the slopes of Hymettus, where our house stands, you may see all, or nearly all, these objects and places to which I have alluded, and it requires a very slight effort of vision to see the spot from which the great orator's voice rang, the theatre where the great masterpieces of the drama were enacted, and the Areopagus, famous both in the earliest dawn of Greek history, and in the commencement of Christianity. And if Athens be the best place in which to study Greek archæology, it is rapidly becoming, I fancy, the only place, and for this reason, that the discoveries which have been recently made in Greece are of so large and interesting and fascinating kind that the work will soon be carried on here alone with advantage. The soil of Greece is giving up treasures which have been buried for centuries. Athens alone has produced a rich harvest. Discoveries are being made in the mystical soil of Eleusis; Sicyon, which overlooks the Corinthian Gulf, has afforded much; ancient Tiryns, with its Cyclopean walls, has disclosed marvels of the Old World. In Mycenæ the work of excavation is going on. Delos, which, as the poets feign, is bound by adamantine chains to the depths of the sea, and only twice, I think, underwent an earthquake,—once before the Persian invasion and once during the Peloponnesian war, the meeting-place of the great Ionian races,—is now being explored, I think, by our French rivals; and, lastly, Olympia, the solemn meeting-place of the games, has given up treasures of the highest worth. And in Delphi, where the oracle spoke to a wondering and awe-struck world, we are not without great and valuable records of the past. I might go on for a long time in the mere enumeration of what has been done. But the important part of these discoveries is this,—that the Greek Government has, with infinite care and loving attention and skill, brought together in the Museum at Athens the principal works of art and interest which have been discovered. All this is ample justification for the School, and all that we now want are the necessary funds, without which no institution in the world can exist. Our great French and German rivals in this field of classical labour are so convinced of its value that their Governments have made large and handsome grants in aid. In America the Government gives no assistance, but private munificence has stepped in, and endowments and subscriptions before which our utmost private efforts pale have been made by high-minded and liberal American citizens. In England, I am sorry to say, we have a more uphill task. Our Chancellors of the Exchequer are by nature and tradition very obdurate. During the life of my dear friend Sir S. Northcote I might have had great hopes. He was one who *nil Græcum, nil Latinum a se alienum putavit*. I have some hopes of Mr. Goschen, who was a contemporary of mine at Oxford, and who had there a distinguished classical career. Therefore I would suggest to our secretary that he should press these reminiscences on Mr. Goschen on the first favourable opportunity, and use every influence he can bring to bear to induce him to assist us. But our best hope is in private liberality; and although I know well that every class and interest in this country feels the depression of trade and of finance, still there is a great deal of money left in the country, and I think also a great deal of the old spirit still exists, and we shall not make our appeal in vain. I beg to move the adoption of the report.

The Earl of Morley seconded the motion, which was agreed to.

After the transaction of some formal business,

Mr. Penrose gave an account of his work during the past year. He had been able to visit and collect objects of art from Palermo, Oropus, Sicyon, and other places, and in his labours the American and German archæologists had afforded him much valuable help. He had, unfortunately, contracted a fever, but had been able to give lectures on the Parthenon, the Erechtheum, and other subjects, and had been honoured by the presence of Sir Horace and Lady Rumbold, and Mr. Watts, the artist. Mr. Hogarth, Mr. Clarke, and other students had been doing good work, and had achieved valuable results.

Lord Carnarvon moved a vote of thanks, which was heartily given, to Mr. Penrose for the great services which he had rendered the School.

Professor Jebb moved a vote of thanks to Lord Carnarvon, who had been connected with the project from its inception, and had throughout shown an active interest in its work. It was just twenty years ago when a resolution

was passed in that room, in pursuance of which Lord Stanhope pressed the claims of such work as they had been engaged in on the attention of that distinguished scholar, Lord Sherbrooke, then Mr. Lowe and Chancellor of the Exchequer. But the only recommendation they got was to look for some Mæcenas. There were plenty of Mæcenates and Herodæ Attici in the country, but it was difficult rightly to guide their efforts. Their chairman was known as a translator of the Odyssey. Their school had not, like the heroine of that poem, many suitors as yet; but their chairman was amply endowed with the qualities of the hero Ulysses, resource and patience.

Sir C. Newton, late Keeper of the Greek and Roman Antiquities in the British Museum, seconded the motion. As a veteran he was not disappointed at the number of students, as the qualities of a real student were difficult to find in combination, and the gentlemen who were now students of the School had shown themselves to be possessed of those qualities. Great results were to be expected from their labours, such as those which the French archæologists had already obtained in Delos. He desired specially to refer to the Greek journal, Ἐφήμερις Ἀρχαιολογική, which was a model of what a paper devoted to such subjects should be, and ought to excite the emulation of English scholars.

The vote of thanks was heartily accorded, and the meeting separated.

[The *Times* report, from which we quote the foregoing, says that the meeting was held in the rooms of "The Society of Athens." For "Athens" read "Antiquaries."]

THE NEW TAY BRIDGE.

By the completion of the new Tay Bridge another gigantic engineering undertaking has been brought to what, judging from the tests applied and the structural precautions adopted, appears to be a satisfactory conclusion, and an important link in the chain of railway communication between the north and south of Scotland will be re-established. To the North British Railway Company the completion of the bridge begins a new chapter in its history which promises within the next few years to be pregnant with great results,—seeing, as it is hoped it will do, the completion of the Forth Bridge, the construction of the new Glen Farg Railway, and the opening of a direct route between South and North. There is no need, at this time, to recall the history of the former ill-fated Tay Bridge, which, after a brief existence of little over two years, fell with such tragic accompaniment on December 29, 1879. We quote the following particulars as to the new bridge from the *Scotsman*:—

In considering the question of the reconstruction of the bridge, the idea at first mooted was to utilise the old piers as far as they might serve, and a Bill on these lines was promoted in Parliament in 1880, which, however, failed to pass. Later in the same year the complete abandonment of the old viaduct was agreed to, and it was resolved that a new bridge should be erected twenty yards further up the river, having a double line of rails instead of a single line, as in the case of the old bridge. The fallen bridge had cost 350,000*l*., and on the new structure it was proposed to expend 670,000*l*. As a matter of fact, however, the bridge has cost nearer a million sterling, which has been solely defrayed out of the funds of the North British Railway Company. Parliamentary sanction having been obtained, designs were submitted for the bridge by Messrs. W. & H. Barlow & Sons, engineers, London, and in November, 1881, an offer for its construction by Messrs. Arrol & Son, contractors, Glasgow, was accepted. It was not, however, until June, 1882, that a start was made with the bridge; and though a good deal interrupted, especially in the winter, by the storms which are frequent in the Tay valley, the work has gone on continuously since. Of its kind the bridge is a very handsome structure, though in its general aspect it has nothing but its great size to distinguish it from any modern viaduct. There are no novel principles of engineering introduced into its construction, as at the Forth Bridge, the chief parts consisting of lattice girders carried on piers, erected in sets of two, across the river. Its total length is 10,780 ft., or just a little over two miles. The number of its piers is eighty-six, with spans varying from 68 ft. to 245 ft. There are eleven spans of the largest size, two of 227 ft., and the rest are for the most part either 145 ft., 129 ft., or 71 ft. in width. The large spans are in the middle of the river, where the bridge, at its highest point, has a clear headway of 77 ft. above high-water level, or 11 ft. lower than the headway of the old bridge. From the Dundee side the bridge leaves the esplanade with a fine sweeping curve on a rising gradient of 1 in 14, which takes it out to the deep water. In the centre its straight line is broken by raising the height of the thirteen central piers, so as to admit of the rails being laid on the lower members of the large girders. North and south of this portion the rails are on the upper "booms." From the centre the gradient falls away to the south, and the bridge is joined on to the high rocky shore at Wormit by a series of four massive brick arches, which terminate in a great land abutment of immense strength and solidity.

In the founding of most of the piers which stand in the water, malleable iron cylinders of different diameters have been used. For those in the deep water of the centre of the river and carrying the large girders the basal diameter is 23 ft., with a taper upwards to 17 ft. 6 in. On each side of these the basal diameter of the cylinders is 17 ft., with a proportionate taper, and in the shallow water on the north side 15 ft. The founding of the piers took about three years and a half to accomplish,—the last of the deep-water cylinders having been put into its place on the 10th of June, 1886. In the process of founding, which took place from ingeniously-constructed pontoons, a large steel mechanical digger was used; and in addition to excavating the sand, gravel, and boulder clay of the river bed, the labour was enormously added to by the removal of hundreds of tons of large stones, which had been put into the river with the view to their gathering round the foot of the piers of the old bridge to prevent "scouring." The average depth to which the cylinders have been sunk is 30 ft. below the bed of the river, but many of them are founded much deeper down than that,—several going down as much as 84 ft. below low-water mark. Each cylinder on being founded had its interior filled with brickwork and concrete, so that a shaft of great solidity and strength was thereby formed.

The testing of the piers under the Board of Trade supervision was a work which entailed an enormous amount of labour, each pier having had heaped upon it blocks of pig-iron varying in weight from 1,248 tons for the smaller columns to 2,500 tons for the larger. This enormous strain,—which is inconceivably greater than anything that can ever be put upon the piers by the superstructure of the bridge and the traffic upon it, was, it is understood, in all cases successfully withstood. This strain is popularly described as being 33 per cent. more than would be put on the piers supposing the bridge were loaded with locomotives standing close to each other on both lines of rails.

From low-water up to 18 in. above high-water level the cylindrical shafts are continued in solid brickwork, the facings being of blue vitrified Staffordshire brick, which is quite impervious to the action of water. At 18 in. above high-water, binding girders are carried between the two members of each pier, and upon this a course of granite surmounted by 7 ft. of blue brickwork is erected. This forms a solid base for the superstructure of wrought-iron which rises to the level of the bed-plates of the railway girders. This superstructure consists of a frame-work of wrought-iron plates ¾ in. thick, firmly braced in the interior with angle and T-bars, and tied down to the piers by bolts passing 22 ft. down into the brickwork.

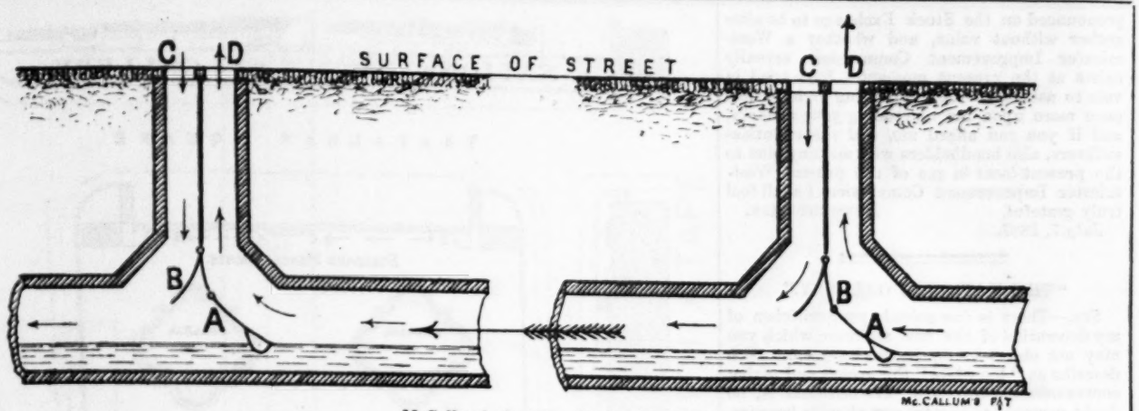
The girders employed are of two types. Those for the smaller spans are lattice girders, of uniform depth, strengthened by vertical half braces, alternating with cross braces at each second lattice. For the thirteen large spans in the middle of the river, hog-backed girders curving from 20 ft. at the ends to 28 ft. at the centre, are employed. The whole of the girders for the deep water spans are newly constructed. North and south of this, some of the girders of the old viaduct were, after being thoroughly tested, lifted over to the new bridge, and form the outermost members of the various sets of four which stretch from pier to pier. Wind pressure has been provided against by lateral bracing, and, to serve at once as a wind screen and parapet, there is on each side of the bridge a continuous side lattice-work, 5 ft. 6 in. in height, surmounted by an oak coping. The immense girders were floated out from the jetties on either side upon pontoons, were placed on the piers at high water, and were raised to the requisite height by hydraulic jacks. It is estimated that 18,000 tons of iron were used in the construction of the large girders, and ten millions of bricks in the arches and lining of the cylinders, &c. The permanent way is laid on the top of a strong ridge-and-furrow flooring, and on the outer side of the ordinary rail there is a check rail to prevent the possibility of the train leaving the metals. The whole of the bridge has been painted a dull red colour. One very gratifying feature about the construction of this gigantic undertaking has been the fewness of the serious accidents attending it,—a fact due to the first-rate staging which was employed, and to the care with which all details were supervised by the resident engineers. Messrs. Barlow, the engineers, were represented by Mr. Kelsey, C.E., and the contractors by Mr. W. Inglis, C.E. The work has also had the benefit of the constant personal supervision of the head of the contracting firm, Mr. William Arrol, who, in the course of its progress, devised not a few ingenious and useful appliances for saving labour and perfecting the methods by which the bridge was built.

The Newport branch line leading to the bridge, and which had to some extent to be diverted by being thrown back so as to improve the junction,—necessitating the construction of a tunnel 140 yards in length,—has also been finished by Messrs. Arrol & Son. A glance at the bridge by those who had seen its predecessor is sufficient to convey an idea of the marked improvement that has been effected in its stability. There is, even to the non-scientific eye, a substantiality and a solidity that impresses one with a sense of security, and this is especially brought home to the spectator's mind when he sees still standing alongside the massive piers that support the new bridge the remains of some of the spindle-like columns that for a time served to uphold the former bridge. During the five years over which the construction of the bridge has extended, a large number of hands, who in the prevailing commercial depression would otherwise have been idle, have found employment. Upwards of one thousand have been at work at one time.

On the occasion of the recent inspection of the bridge by the Directors of the North British Railway Company, the Chairman, the Marquis of Tweeddale, in proposing the toast of prosperity to the North British Railway Company, said that in regard to the Tay Bridge, Mr. Barlow, the engineer, was well known as one of the most distinguished members of his profession in the country, and he was sure they would all congratulate him on the success which had attended the proceedings at the bridge that day. It was one of the finest works that had ever been constructed. It was the longest railway bridge in the world, and he thought he might add with perfect assurance that it was one of the safest. They might congratulate Mr. Barlow on having crowned a long and successful career with the successful completion of this very important work. As to Mr. Arrol, the contractor, he was sure that all recognised him to be one of the most remarkable men of his time. In respect of inventive genius, Mr. Arrol was second to no man in the world; and the manner in which he had carried out the contract of the Tay Bridge, as well as that for the Forth Bridge, stamped him as one of the most prominent practical engineers of whom they could boast in this country.

Mr. W. H. Barlow, in replying, said the carrying out of this bridge had been a hobby of his, and with the manner in which it had been accomplished he was glad to hear so hearty satisfaction expressed. He could not sufficiently thank the contractor for his part of the work. Mr. Arrol had been most correctly described by the chairman, and but for the ability of the contractor the bridge could not have been seen that day in the state in which they found it. To his excellent staff of assistants he also felt that he had been greatly indebted.

Mr. Arrol, in a few words, also returned thanks. The bridge, he said, had been a very pleasant job to him, and that it had been so was due to the support he had received from Mr. Barlow, the assistant engineers (Messrs. Kelsey and Inglis), and from the Railway Company.



McCallum's System of Sewer Ventilation.

THE ROYAL ACADEMY.

ADMISSIONS TO ARCHITECTURAL SCHOOL.

THE following students have been admitted to the Architectural School of the Royal Academy (Mr. R. Phené Spiers, F.S.A., Master) :—

Upper School.

Anderson, P.	McCombie, G. F.
Barnsley, S. H.	Marks, F. W.
Boney, W. H.	Masey, F.
Downing, H. P. B.	Nicolay, G. W.
Gill, C.	Sykes, A.
Ginham, P. M.	Taylor, A.
Harvey, G.	

Lower School.

Baker, H.	Mathewman, H.
Collins, G. E.	Norton, C. H.
Draper, R. E.	Poole, E. E.
Fetch, E. E.	Powell, A. H.
Giles, A. L.	Pywell, A.
Grace, W.	Sampson, R. W.
Horton, W. F.	Taylor, W.
Inman, A. J.	Thompson, A.
Jaques, G. R.	Veal, A. G.
Martin, L.	Verity, F. J.

Probationers.

Bartlett, A. E.	Hastilow, A. G.
Clarkson, W. B.	Hawkins, E. A.
Faulkner, A. F.	Ibberson, H. G.
Frazer, L.	Rogers, H. C.

ARCHÆOLOGICAL SOCIETIES.

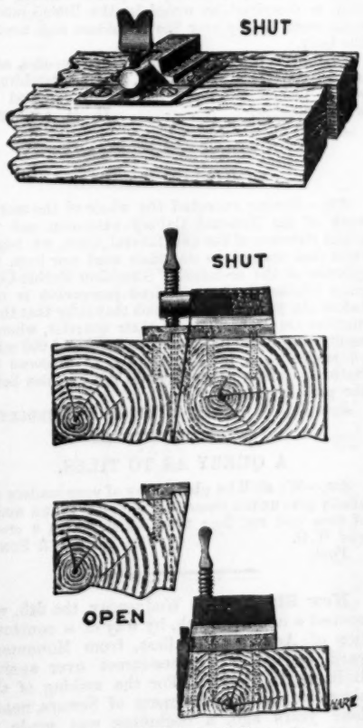
British Archæological Association.—This year's annual meeting of the British Archæological Association will begin on August 15, Liverpool being the head-quarter.

Royal Archæological Institute.—The Royal Archæological Institute will hold its annual meeting this year at Salisbury, commencing on Tuesday, August 2.

Surrey Archæological Society.—On the 5th inst. this society held its annual meeting, and visited the Church of St. Saviour, Southwark, and Lambeth Palace, under the presidency of Viscount Midleton. The former building, one of the most interesting of London churches, is the subject of a complete architectural work by Mr. F. T. Dollman, who conducted the party and described this church. Many of our readers will remember the beautiful Lady Chapel and the fine reredos. In St. Saviour's Church are many noted monuments, and one of surpassing interest to the poet Gower, seen on entering the edifice. The members and visitors, with ladies, reached Lambeth Palace at three p.m., which, by permission of the Archbishop of Canterbury, was thrown open to the society. The fine library, better known as "Juxon's Hall," the picture-gallery, and the chapel, were all seen by the visitors. Mr. S. Wayland Kershaw, F.S.A., described the chief features of the hall, and traced the foundation of the library from Archbishop Sancroft in 1611 to the present day. He also commented on the former library in the "cloisters," which were removed in 1830, and wherein the books were placed previously to their present position in the hall. A paper "On the Manor-houses of the Archbishops in Kent and Surrey," by Mr. Kershaw, formed the next part of the programme, and then the company viewed the series of portraits of the archbishops hung in the state dining-hall. From the "Long Gallery" the private chapel was reached, and Mr. J. P. Seddon, F.R.I.B.A., pointed out its architectural features. The chapel has been entirely renewed within the last six years with stained glass and fresco paintings, some of which are placed in memory of the late Mrs. Tait and her son, and some to commemorate the visit of the American bishops to Lambeth.

PODMORE'S "PATENT SASH-FASTENER."

WE give illustrations of this, which appears to us to be one of the best and most effective sash-fasteners that has been brought out. The self-acting fastener is a bolt fixed in a sheath, on the meeting rail of the top sash, with a spring behind it, which is kept back by a catch when required or when the window is open, but is released by the action of shutting down the lower sash, and springs forward over the bed-plate on the meeting-rail. This forms in itself an effectual fastening, so far as preventing the opening of the window, but a further recommendation is in the action of the screw and nut carried in the bolt, and which can be screwed down so as to hold both sashes perfectly tight, and thus form a defence against draughts and against rattling sashes.



Podmore's Patent Sash-Fastener.

A spring is no doubt always a weak point in a thing of this kind, in so far as it is always liable to weaken with use; but this objection, of course, applies equally to many locks and latches which are in constant use. In other respects the fastener is a very good one, as it both closes and tightens up the window, and is simple in its construction and working. Messrs. Jas. Boyce & Son are the makers and agents.

McCALLUM'S SYSTEM OF SEWER VENTILATION.

IN this method of ventilating sewers, the air-current is caused by utilising the natural action of the flow of the sewage, the air coming in contact with the more powerful element being compelled to travel in the same direction as the water. In order to "harness" this power, the sewers are divided into sections by means of a light flap valve (A on sketch), actuated by a float, and so shaped and arranged that the air-current is intercepted and directed upward. At each end of such a section a shaft is carried to the surface, one (C) to act as a fresh-air inlet, and finished with a grating slightly to one side of the road, and the other (D), to act as an outlet and having its grating in the centre of the road. A curved plate (B) is used to direct the incoming air current; this plate is also hinged so that if an accident should happen to the float of the valve A, the sewage would automatically open B, and thus prevent choking of the sewer.

The constant circulation of air caused by the above arrangement prevents the gases becoming stagnant, and, by means of the large quantity of fresh air introduced and mixed with the sewage emanations, the latter are oxidised and rendered innocuous before emerging into the open. The dividing of sewers into sections also makes each district deal with its own sewer gas.

The large arrow on the sketch shows the direction of the flow of sewage, and the small arrows show the direction of the air current.

DRAIN VENTILATION.

The general principle is the same as with the sewers, but the disconnecting trap takes the place of the valve. Special provision is made at the inlet (which is just above the water-closet connexion) to prevent wind interfering with the air current. The outlet is taken to the centre of the street.

WESTMINSTER IMPROVEMENT COMMISSION AND BONDS.

SIR,—In perusing your very sensible remarks, contained in your issue for July 2 (page 5), respecting the intended Westminster Improvements, as contemplated by the Bill now passing through the House of Commons, I am struck by the practical sense of your recommendation that all great metropolitan improvements should be carried out by a reponsible public body, and you allude with some despondency to the incomplete condition of Victoria-street, Westminster, even at the present day. I share your despondency, but for far different reasons; for I am an unfortunate holder, as a trustee and otherwise, of Westminster Improvement bonds, to the amount of several thousand pounds, and have never during the whole time I have been so possessed,—some quarter of a century,—received more than at most two half-yearly dividends. At that time the secretary of the Commission disappeared, and many stormy meetings of the unfortunate bondholders have since then been held at the Westminster Palace Hotel. The secretary who was appointed after the flight of the first one, a Mr. Jacques, has recently died. The offices of the Commission in Victoria-street, Westminster, have been abandoned. The bonds I represent are

pronounced on the Stock Exchange to be altogether without value, and whether a Westminster Improvement Commission actually exists at the present moment I have tried in vain to ascertain. A glimmering light beams once more upon me on reading your remarks, and if you can afford me, and the countless sufferers, also bondholders with me, any clue to the present *locus in quo* of the present Westminster Improvement Commission, I shall feel truly grateful, KENSINGTONIAN.

July 7, 1887.

"THE NATIONAL GALLERY."

SIR,—There is one point in your criticism of my decoration of the new staircase which you may not object to my remarking upon. You describe as "too white" the arches and string course over the entrance. The criticism is, no doubt, correct as the work now stands; because, since the long panel over this arcade has been hung with the green flock paper (as a temporary measure), this white has been "forced" by the contrast. But I never intended that this panel should be so treated, even temporarily.

From the first I pointed this out to the Trustees as a fitting space for a mural picture; and I so indicated it in my design. As a temporary finish, I had painted this space in light tones; and I still consider that to bisect this elevation by the dark colour was a mistake.

It has the additional disadvantage of making the Carrara marble capitals (and the arcade, which is *toned to match them*) appear somewhat "too white." J. D. CRACE.

Wigmore-street.

GOVERNMENT OFFICES.

SIR,—Even my good friend, H. B. Garling,* has submitted to the seduction of saving a few thousands, which being spent in the centre of London on a national undertaking is no real economy.

Why should he mar a noble scheme by leaving the bottle-neck of Whitehall but 70 ft. wide, and omitting the broad way or continuation of the Mall into Charing-cross? The first scheme was spoiled by retaining the Horse Guards. This proposal is ruined by keeping the Admiralty. EDWD. C. ROBINS.

THE NUISANCES FROM SEWER VENTILATORS.

SIR,—So far as can be judged from his letter on p. 78, it seems to me that Mr. R. H. Reeves draws important conclusions from rather curious premises. He refers to an "offensive" street sewer grating, which had "a brick ventilating pipe" under it, running below the road some 30 ft., and thence up a house wall to half-way up the chimney.

Now if this street grating had no water-trap below it, how could it be expected that stink in the sewer should not blow out at it, even although there was a so-called ventilating pipe put up as stated? If it were trapped, there must have been something faulty, or how else could the bad smell get out?

Then, was the "brick" ventilating pipe carried up the wall, or was the vertical pipe *iron*, and not brick? If iron, what size? and is it not nearly choked at the foot by falling rust, if not painted or coated inside?

Further, if it was desired that this sewer ventilating pipe should act efficiently as a ventilator for the sewer, why was its outlet not carried up to *above* the chimney eaves several feet, and surmounted by a good fixed exhaust ventilator, instead of the outlet stopping at halfway up the chimney?

So far as I can judge at present from Mr. Reeves's letter, he has no sufficient reason, under the circumstances, to write about the "utter uselessness of stack pipes as a means of ventilation to sewers." In my opinion, the said stack pipes,—but properly connected and put up,—will be much more used in the future than they are as yet.

W. P. BUCHAN.

SCULPTURE AT ORVIETO CATHEDRAL.

SIR,—In respect of the central figure over the western doorway of Orvieto, a drawing of which appeared in your issue of July 2, I should be glad to be informed whether it is a representation of the Christ or of the Virgin. The character of the face and arrangement of the tunic about the head and shoulders point, I imagine, to the latter; while the vesica and general surroundings, and especially the use of the stole crossed in front, seem to indicate the former.† I should be much obliged, also, to any of your readers who would furnish me with notes of representations of the Saviour, with reference more especially to the vestments worn and position of the figures, which occur in existing remains of Mediæval art, in glazing, mural paintings, MS. illuminations, and in statuary, both in England and on the Continent.

The most notable representation which has hitherto come under my notice occurs in a mural painting in the Chapel of St. Gabriel, in Canterbury Cathedral. The figure is vested in an alb-like tunic, with rich collar and band-shaped girdle; over this is worn the stole (not crossed), the ends of which appear from under an apron attached to the girdle. Above all is a loose tunic, covering one shoulder and knee, and appearing upon the opposite arm. As I write from memory, I cannot give the colours of these vestments.

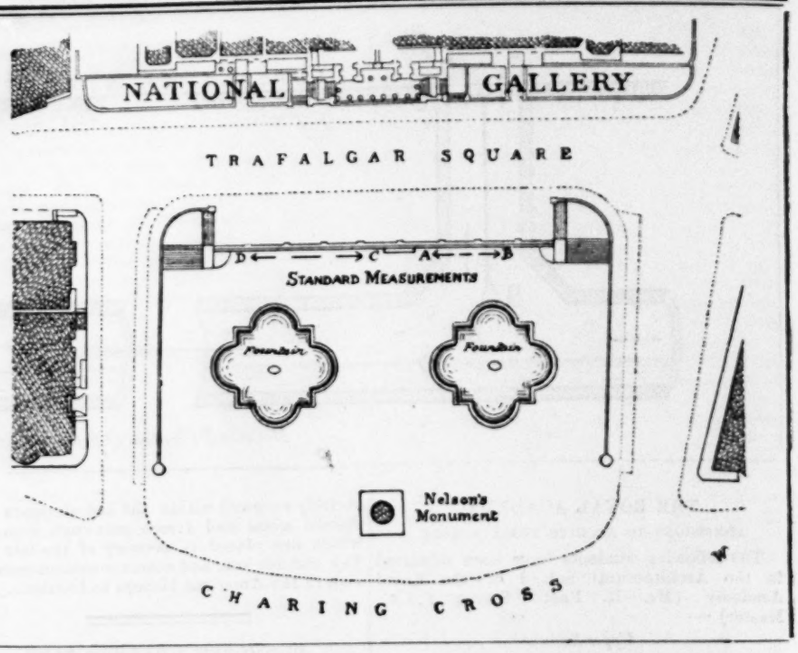
The most common method of vesting the sacred form shows the two garments ordinarily used by the Jews: the *cethoneth*, or closely-fitting garment, with or without a girdle,—a person wearing this only is described as *naked* in the Bible,—and a tunic worn loosely over the shoulders and around the body.

Sometimes the latter garment only appears, as in a memorial brass at Sibstone, in Leicestershire, of which Bishop Mitchison has kindly supplied me with a rubbing. G. M. LIVETT.

Holy Trinity, Twickenham.

* See pp. 9, 10, *ante*.

† In spite of the vesica, it appears to represent the coronation of the Virgin; but this, if we mistake not, is a modern mosaic.—ED.



NUMIDIAN MARBLE.

SIR,—Having executed the whole of the marble work of the National Gallery extension and the grand staircase of the new Liberal Club, we beg to state that none of the materials used are from the quarries of the so-called "Numidian Marble Company Limited," whose revised prospectus is now before the public, and in which they infer that these marbles are the produce of their quarries, when in reality they are shipped at ports 200 and 600 miles off respectively, in North Africa, as concerns the National Gallery; the Liberal Club marbles being the products of Italy.

July 13. FARMER & BRINDLEY.

A QUERY AS TO TILES.

SIR,—We shall be glad if any of your readers can kindly give us the name and address of the maker of blue and red floor tiles, branded with *a crown and W.G.* GEO. BENSON & SON.

York.

New Street.—On Wednesday, the 6th, was opened a new approach, by way of a continuation of Arthur-street East, from Monument-yard to Lower Thames-street over against Billingsgate Market. For the making of this street by the Commissioners of Sewers, nearly four years ago, a beginning was made by pulling down part of Monument-yard. In its course through Pudding-lane, Botolph-lane, and Love-lane, forty-nine houses had to be removed. Of the 108 claims for compensation only four, we are told, were referred to settlement by jury. The cost of the construction is large, amounting to 490,966*l.*, inclusive of the subway. The subway is 12 ft. in diameter by 7 ft. 6 in. in height. It has a central footway, and rails are laid along its length for the transit of a trolley.

The Student's Column.

LAND SURVEYING AND LEVELLING.

III.—THE CHAIN AND CHAINING (*continued*).

CHAINS when new ought always to be examined to see if they are of correct length. They also stretch with frequent use, and need to be afterwards occasionally tested. Special standards for the use of surveyors in London have been fixed by the Government at Trafalgar-square (see fig. 5), and also in the Guildhall. Their lengths are derived from the British standard yard, which is the distance at the temperature of 62° Fahrenheit between two marks upon a certain bar, which is preserved in the office of her Majesty's Exchequer, official copies being kept at the Royal Mint, the Royal Observatory at Greenwich, and in the rooms of the Royal Society. The length of the standard yard was finally fixed and legalised by the 5th Geo. IV., c. 74, which declares that "the pendulum vibrating seconds of mean time in the latitude of London in a vacuum at the level of the sea is 39·1393 inches of the standard, and that the yard shall be in the proportion of 36 to 39·1393."

The standards above alluded to for testing chain measurements in London are marked upon pieces of brass let in flush with the masonry into which they are fixed, as indicated in fig. 7. Permanent standards have likewise been fixed by various municipal authorities in prominent positions over different parts of the country. For the purpose of testing the chain employed in an extensive survey during the progress of any work, it is well to fix two pegs upon a level piece of ground near a fence, and at a distance apart just sufficient to enable the outside of the handles of a correct chain when drawn tightly to touch the inner sides of the pegs, as shown in fig. 3 (*Builder*, July 9th, p. 78). This arrangement is better than making the chain's length measure from centre to centre of the pegs. The test distance may be set out very accurately with a level staff, or, better still, with two level staves placed end to end in measuring the line, provided each level staff has been previously tested upon the Government standards. It is sometimes well to keep a properly-tested spare chain in reserve, to be used only for purposes of testing, when a level staff is not near to hand, and the distance should be proved, prior to each testing of a chain, as pegs have been known to be purposely moved by parties interested in opposition.

Figure 8 illustrates the measurement of a base line, and the method of taking offsets from one side of it to a fence line. The station or point upon a line from which the measurement is to commence being first determined, the leader carrying all the arrows draws the chain in the direction of the line to be measured, and is guided by signs from the follower who sights the line of poles or other marks, which determine the direction of the base line. The ten arrows are used as tallies, thus:—When the leader reaches the full stretch of the chain, the other end being

IMPERIAL STANDARD CHAIN OF 66 FEET

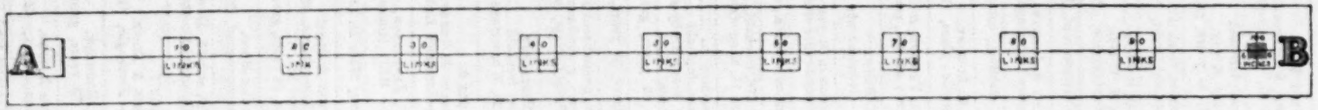
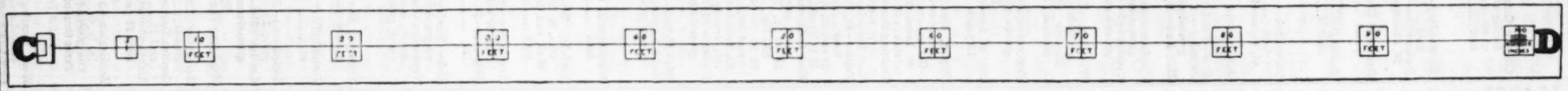


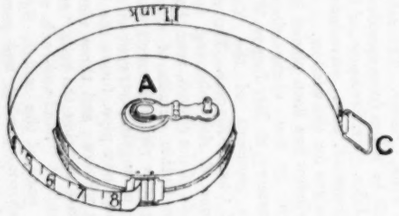
FIG 6

IMPERIAL STANDARD CHAIN OF 100 FEET



MEASURING TAPES

FIG 7



FLUSH HANDLE TO TAPE BOX

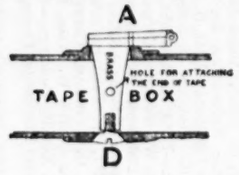
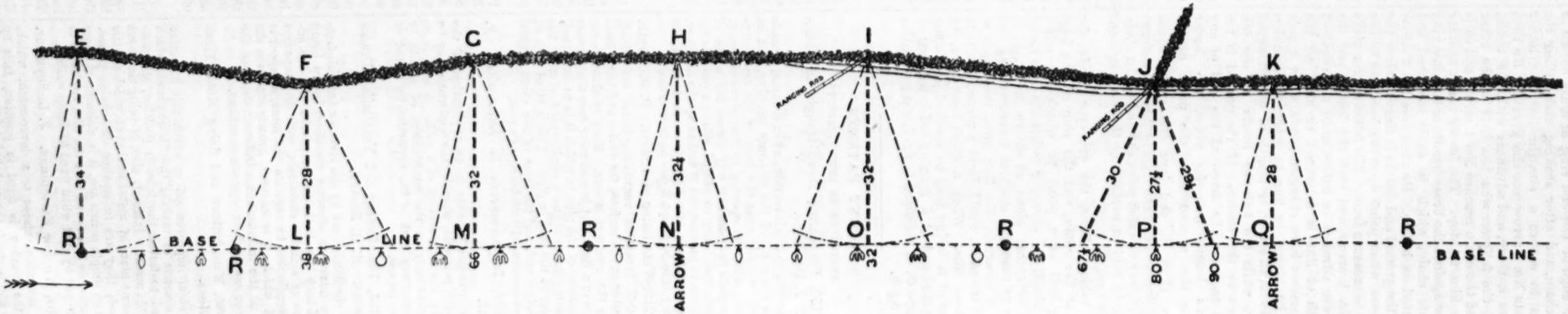


FIG 8 - DIAGRAM ILLUSTRATING THE MEASUREMENT OF OFFSETS WITH A TAPE



held fast by the follower, the leader holds an arrow vertically, as shown in fig. 2, against the outer edge of the end ring or brass handle of the chain, and after shaking and pulling the chain to ensure a straight line, the leader thrusts No. 1 arrow into the ground. He then leaves it there, and advances with the chain, until the follower who has hold of the other end of the chain reaches No. 1 arrow, and calls upon him to stop. The leader places another arrow against the brass handle or terminal ring of his chain, which is again stretched and directed as before. He then fixes No. 2 arrow into the ground and leaves it there to show the follower what point upon the base line he has next to measure from. The follower now picks up No. 1 arrow, and both the leader and the follower advance as before, until the required length of line is measured, or until all the ten arrows have changed hands, when a pole can be placed in line to mark the position of the tenth arrow, or length of one thousand links, while the follower hands all the ten arrows to the leader. If the ground is too hard to press the arrow at the end of any chain's length into its place, the leader marks the ground with the point of an arrow, thus, $\overline{\wedge}$ and lays the arrow down. The intersection of the lines in this mark shows the follower to which point the end of the chain has to be held in continuing the measurement of the line.

In taking offsets, the surveyor reads the tape at the chain, and the ring of the tape being held at a point to which the offset is required, the surveyor twists the tape round in a horizontal plane, as shown in fig. 8, in order to read the shortest measurements, and also to ascertain the link upon the chain at which the offset would form a perpendicular to the base line. When a ditch intervenes, the centre of a hedge may be reached by placing the spiked end of a ranging rod in the ring of the tape C, as indicated in fig. 7, and proceeding as in fig. 8.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

10,150, Preventing Down-draught in Chimneys. J. De Baere.

According to this invention, a box or casing is made double the width of the chimney opening, and an opening is made near the back of the case corresponding with the opening or flue of the chimney. A stop-plate projects half way across the width of the case, and being so placed allows a passage for the smoke to pass around it and so up the chimney. The stop-plate is also hinged, so that when the chimney is to be swept it can be turned back.

10,219, Ventilation of Drains. P. R. Smyth.

By this invention ventilating-boxes are fitted, preferably at the surface, for drains and traps leading to the common sewers. Each of these boxes consists of a light cast-iron circular case about twice the diameter of the pipe to which it is to be fitted, and having in the centre a smaller pipe of near the diameter of the trap or pipe. This is fitted with an open spigot end, and the sides of the short central pipe are perforated with holes, as a rose.

10,682, Improvements in Lavatories. P. Everitt.

This invention consists in an application of the automatic principle, whereby the appliances may be used by the introduction of a coin. A lock is so fixed that only on the introduction of a coin or token can any part of the apparatus be raised or lowered for use.

13,313, Disinfecting and Ventilating Drains or Sewers. R. H. Reeves.

The chemicals used by the inventor for disinfecting are mixed in separate chambers before being passed into the basin or receptacle. By the admixture of suitable chemicals, with drip-taps and other appliances to regulate the same, a vapour is formed which, it is claimed, greatly increases the power of the disinfectant. Different forms of the appliance are used for separate situations.

14,386, Manufacture and fixing Metal Tiles. F. H. Rees.

The chief improvement to which this invention refers consists of making the flange-pieces, which are used to fasten the tiles in position, of a non-corrodible metal. Instead, also, of being made out of the same piece of metal as that of which the tile is formed, they are in smaller detachable pieces. These two simple points are, it is claimed, of some importance, as it is found that the tiles are liable to be destroyed by rust when fixed to damp walls.

16,694, Window Fastenings. J. L. Seymour.

This invention relates to a lever-catch, which, when the window is fixed in position, falls by gravity and prevents the sash being lifted.

6,494, Metallic Roofing. L. L. Sagendorph.

By this invention special ridges and corrugations are made with the view of forming a joint which is perfectly impervious to water, and which is easily connected, and allows the tiles to be readily secured in place. The form slightly varies for special purposes, but is not unlike the general make of metallic tiles.

NEW APPLICATIONS FOR PATENTS.

July 1.—9,328, S. Bromhead, Intermittent Valve Action for Water-closets, &c.

July 2.—9,384, J. Miller, Ventilators.—9,398, J. Jobson, Domestic Fire-grates.

July 4.—9,434, J. Easley, Automatic Apparatus for Dry Closets and Water-closets.—9,448, H. Allan, Service Cisterns for Water-closets, &c.—9,452, W. Youlten, Sliding Window Sashes.—9,457, S. Hill and R. Hodges, Spring Hinges for Swing Doors.

July 5.—9,479, M. Sherry, Planing and Dressing Wood.—9,489, W. Lee, Circular-saw Spindles.—9,504, C. Norton, Window Fasteners.

July 6.—9,535, T. Smith, Excavating Apparatus.—9,548, E. Hurley, Chimneys and Ventilating Shafts.

July 7.—9,583, D. Goddard, Wood Block Paving for Floors.—9,585, R. & C. Kidd, Opening and Closing Ventilators.—9,593, H. Hansom, Fireplaces.—9,605, G. Innes, Manufacture of Portland Cement, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

7,516, H. Godwin and W. Hewitt, Making and Connecting Tile or Ceramic Fenders and Mouldings.—7,757, C. Rabbitz, Construction of Walls, Ceilings, Roofs, &c.—7,810, C. Irwin, Auger Bits.—7,959, G. Lewis, Flooring Wainscoting, &c.—4,046, P. Chinnery, Window Fasteners.—7,341, H. McKibbin, Hinges.—7,389, R. Fladgate, Securing Double Doors, Panels, &c.—7,584, H. Schallehn, Domestic Fireplaces.—7,976, W. Hawarth, Chimney Pots.—7,983, J. Root, Distemper Paint Brushes, &c.—8,055, W. Thompson, Roofing.—8,316, C. Laspe, Fire Bricks.—8,361, H. Belcher, Brick-pressing Machine.—8,473, G. Newman, Combined Door Spring and Check.—8,810, W. Wise, Flooring.—8,914, J. Danby, Metallic Buildings.—8,939, J. & J. Crombie, Concrete Pavements, Floors, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

10,408, J. Wilson, Ventilation of Rooms.—10,625, J. Denny, Tiles for Enclosing Girders and Construction of Ceilings, &c.—11,266, J. Jones, Hanging Sash Windows.—797, M. Hussey and W. Clark, Roofing Tiles and Slates.—10,919, T. Bayliff, Chimney-tops, Cowls, or Ventilators.—11,360, G. Soper, jun., Hanging Sashes.—11,435, R. Bucknall, Construction of Temporary Buildings.—12,031, M. Syer, Syphon Water Waste Preventers.—4,598, S. Elliott, Metal Water Bars for Doors and Windows Opening Inwards.—7,644, F. Wicks, Paving, Flooring, &c.

STAINED GLASS.

Chester.—A Manchester paper says that the Duke of Westminster is about to fill with stained glass the great west window of the Church of St. John, Chester. The subjects to be depicted will be taken from episodes in the history of St. John. Mr. Frampton, of London, has, it is understood, been commissioned to prepare the designs for the window.

Ilkley.—A window has been placed in Ilkley Parish Church by the change-ringers of England, in memory of Mr. Jasper Whitfield Snowdon, late president of the Yorkshire Association of Change-Ringers. The window, a three-light one of rich colouring, is placed at the north-side of the church, near the tower, and introduces Gothic details of stonework, with swinging bells visible through the openings. A group of angels, portrayed as offering praise on strings and pipe, forms the leading feature of the window; and three views are given in the base showing the bells "at rest," and when "set" at "hand-and-back stroke." In the upper part of the middle light the heavens are shown opening, and permitting the sacrifice of praise to ascend; and across the three lights are scrolls bearing portions of Psalm cl. The entire work has been designed and executed by Messrs. Powell Brothers, of of Leeds.

Holborn Theatre.—The Holborn Theatre, High Holborn, which has been for a long time vacant, is about to be converted into a public hall, which is proposed to be called West Central Hall. The hall will be about 160 ft. long and 85 ft. wide for the greater part of its length, and 54 ft. high, to the apex of the roof. The hall will have two tiers of galleries, and will have exits into French Horn-yard and Eagle-street. The architect is Mr. E. Clark, of West Strand.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

JULY 1.

By R. REID.

Charing Cross-road and Shaftesbury-avenue—The letting of 52 plots of building land, for a term of 80 years, averaged from 9d. to 4s. 9d. per foot

JULY 4.

By F. J. BISLEY.

Bermondsey—1, 3, and 5, Francombe-street, freehold — £770
Rotherhithe—44 and 50, Swan-street, freehold — 390
26, Clarence-street, freehold — 180

By J. & R. KEMP & Co.

Barnes — Ground-rents of 19*l.*, reversion in 80 years — 390

By BEARD & SON.

Paddington—33, Herries-street, 89 years, ground-rent 5*l.* — 235

JULY 5.

By BEAL, SON, & CHARTRES.

Shoreditch — 77, 79, and 81, Curtain-road, freehold — 3,100
83, 85, and 97, Curtain-road, freehold — 4,500

By DALE & SON.

Ratcliff—115, Brook-street, 33 years, ground-rent 10*l.* — 100
Bow—5 and 6, Merchant-street, freehold — 730
Bromley — 9 to 15, Eastwood-street, 76 years, ground-rent, 24*l.* 10*s.* — 455
Mile End—69, Oxford-street, freehold — 345

By C. & H. WHITE.

Clapham-road — 28, Aldebert-terrace, 76 years, ground-rent 7*l.* 10*s.* — 550
Camberwell—54 and 56, Coleman-road, 73 years, ground-rent 11*l.* — 400

By PATCHING & JORDAN.

Worthing.—The freehold house "Grayingham," and grounds — 2,300
Augusta House, with stabling, cottage, and grounds, freehold — 1,700

By E. & H. LUMLEY.

Portman-square — 4, Granville-place, 66 years, ground-rent 55*l.* — 2,000

By DEBENHAM, TEWSON, & Co.

City of London—Ground-rent of 42*l.*, reversion in 10 years — 2,210

By B. BROWN.

Poplar, Burcham-street — Ground-rents of 16*l.*, reversion in 67 years — 335
Ground-rents of 8*l.*, reversion in 58 years — 165
St. Leonard's-avenue—Ground-rents of 8*l.*, reversion in 68 years — 165
Canning Town—Ground-rent of 33*l.* 10*s.*, reversion in 89 years — 710
East India Dock-road—No. 178, freehold — 830
Poplar—41, Pennyfields, and 14, King-street, copyhold — 1,030
24 and 26, Rook-street, freehold — 270
13 to 39 odd, Frances-street, freehold — 1,910
East India-road—16 to 22 even, Kerby-street, 55 years, ground-rent 12*l.* 10*s.* — 995
61 to 77, Tetley-street, 55 years, ground-rent 22*l.* 10*s.* — 1,360
72 to 78 even, Tetley-street, 55 years, ground-rent 12*l.* — 670
42, Tetley-street, 55 years, ground-rent 2*l.* 10*s.* — 315
195, Grundy-street, 55 years, ground-rent 2*l.* 15*s.* — 210
Poplar — 13 to 19 odd, Follett-street, 62 years, ground-rent 12*l.* — 960

T. B. WESTACOTT.

High Barnet—5, High-street, freehold — 340
North Kensington—18 and 2½, Wheatstone-road, 88 years, ground-rent 15*l.* — 420

JULY 6.

By WEATHERALL & GREEN.

Wandsworth, Garrett-lane—Somerset Lodge, freehold — 700

By W. W. JENKINSON.

Norfolk, West Walton — Hill House Farm, 164*a.* 3*r.* 29*p.*, freehold — 5,150
Wall and Garton's Farms, 275*a.* 2*r.* 32*p.*, freehold — 8,000

By HAMPTON & SONS.

Kensington—52, Queen's Gate-gardens, and stabling, 69 years, ground-rent 22*l.* — 5,250
Belgravia—28, Eaton-terrace, 34 years, ground-rent 12*l.* — 3,700

By HARMAN BROS.

Stoke Newington—110, Cazenove-road, 90 years, no ground-rent — 1,210
Newington Causeway—42, 50, and 52, Devonshire-street, and 1 to 16, Devonshire-cottages, 22 years, ground-rent 52*l.* — 1,430

JULY 7.

By MANSELL & ROWE.

Norwood, Beulah-hill—The Rectangle, 74 years, ground-rent 38*l.* — 600

By H. J. BROMLEY.

Forest-hill—7, Wood-vale, 73 years, ground-rent 8*l.* — 450

By GLASIER & SONS.

Barnsbury — 52, Huntingdon-street, 62 years, ground-rent 1*l.* — 800
Kentish Town—23, Lady Margaret-road, 75 years, ground-rent 1*l.* — 510

By PRICKETT, VENABLES, & Co.

Mitcham—The Fountain Print Works, freehold — 350

By NEWSON & HARDING.

Barnsbury—123, Hemingford-road, 55 years, ground-rent 5*l.* — 450
Camden Town—68, Arlington-road, 13 years, ground-rent 1*l.* — 220
Kingsland-road—Improved ground-rents of 18*l.* 10*s.*, term 21 years — 505

By HUMBERT, SON, & FLINT.

Beddington—A plot of freehold garden ground, 1*a.* 1*r.* 0*p.* — 295
Two freehold cottages — 300
Three freehold cottages — 310

JULY 8.

By J. M. KLENCK & Co.

West Kensington — 71, Blythe-road, 94 years, ground-rent 13*l.* — 350
Forest-gate—36, Strode-road, freehold — 440

By GEORGE GOULDSMITH, SON, & Co.

Belgravia — 68 and 70, Ebury-street, 36 years, ground-rent 13*l.* £2,750
6, 7, and 8, Ebury-mews, 36 years, ground-rent 8*s.* 470
Pimlico — 74, Warwick-street, 36 years, ground-rent 8*l.* 10*s.* 630
Brompton—34, Montpelier-row, 39 years, ground-rent 15*l.* 90

By BAKER & SONS.

Harrow—A plot of freehold land 100
A plot of about Three Acres, freehold 720
Paddock Wood, Kent — Beltring Farm, and 46*a.* 2*r.* 32*p.* freehold 2,610

By NORTON, TRIST, & GILBERT.

Bloomsbury — 35, Great Russell-street, 59 years, ground-rent 40*l.* 1,650

By DRIVER & Co.

Rotherfield, Sussex—Ground-rent of 6*l.*, reversion in 96 years 120

By REYNOLDS & EASON.

Hackney—28 and 30, Broadway, and 1 to 5, Goring-street, 44 years, ground-rent 15*l.* 10*s.* 1,130
31, 33, 43, and 45, Parmiter-street, 43 years, ground-rent 8*l.* 12*s.* 450
14 and 16, St. Peter-street, 21 years, ground-rent 7*l.* 250
34 and 36, St. Peter-street, 54 years, ground-rent 6*l.* 430
84 and 86, Old Ford-road, 14 years, ground-rent 5*l.* 12*s.* 100
Hackney-road—No. 371, and 13 and 26, Gloucester-street, 28 years, ground-rent 8*l.* 6*s.* 6*d.* 475
64 to 72, Treadway-street, 18 years, ground-rent 10*l.* 10*s.* 315
9, Patriot-square, freehold 330
Bethnal-green—74 and 76, Cheshire-street, 31 years, ground-rent 4*l.* 410
Shoreditch—11, Mead-street, freehold 220

By NEWSON & HARDING.

Camden Town—21 and 23, York-road, term 54 years, ground-rent 14*l.* 650
Kentish Town-road—No. 150, term 28 years, ground-rent 50*l.* 550
St. Luke's—77 and 79, Lever-street, 17 years, ground-rent 5*l.* 410
Seven Sisters-road—14, Campbell-road, freehold ... 225
Peckham-rye, Stewart-road — A plot of freehold land 21
Islington—18, St. Peter-street, freehold 685
Peckham—Ground-rents of 35*l.*, reversion in 65 years 895
Bermondsey—An improved rent of 36*l.*, term 59 years 595
Notting-hill—250, Portobello-road, 76 years, ground-rent 10*l.* 510
49 and 51, St. Mark's-road, 76 years, ground-rent 16*l.* 1,175
Marylebone—16 and 17, Richmond-street, 34 years, ground-rent 10*l.* 485
Seven Sisters Road—2 and 4, Palmerston-road, 78 years, ground-rent 14*l.* 260

MEETINGS.

SATURDAY, JULY 16.

Architectural Association.—Visits to Sutton Place, near Guildford, and Loseley Park. (See advertisement on p. i., July 9.) Trains from Waterloo at 9.45 a.m., and 2.45 p.m.

Association of Municipal and Sanitary Engineers and Surveyors.—Annual Meeting at Leicester. (Third Day.) Visits to Victoria Stone Company's Works, Bradgate Reservoir, Mount Sorrel Granite Quarries, and the Barrow Limeworks.

St. Paul's Ecclesiological Society.—Visit to Salisbury. Train from Waterloo at 9.0 a.m.

Liverpool Engineering Society.—Excursion to view the Park Extension of the Mersey Railway, the Wirral Railway, and the Bidston Observatory.

TUESDAY, JULY 19.

Victoria Institute.—Annual meeting: Address by Professor Stokes. 8 p.m.

WEDNESDAY, JULY 20.

Builders' Foremen and Clerks of Works' Institution.—Half-yearly meeting. 8·30 p.m.

Miscellanea.

The Will of the late Sir Horace Jones. The will of Sir Horace Jones, the City Architect, late of 30, Devonshire-place, and 4, Codrington-place, Brighton, and also of the Guildhall, who died, on May 21st last, was proved on the 2nd inst. by Dame Ann Elizabeth Jones, the widow, and Mr. Octavius Hansard, two of the executors, the value of the personal estate exceeding 20,000*l.* The testator gives all his household furniture, plate, glass, linen, pictures, carriages, horses, wines, consumable stores, and jewelry, and 1,000*l.* to his wife; 20*l.* to his executor, Mr. Hansard; the use, rent free, of his house, White Lodge, Sunbury, to his three sisters, Mary Shepherd Jones, Sarah Gardiner Jones, and Lydia Lynch Jones, for their lives, and numerous legacies to relatives and friends. His property at Rotherhithe, together with his houses, 22, Ulster-place, and 52 and 54, Cannon-street, he leaves upon trust for his wife for life or widowhood, and then to his daughter, Annie Horatia. The residue of his real and personal estate he leaves upon trust for his wife during her life or widowhood, and then to his said daughter absolutely; but by a codicil the testator (in the event of his having other children besides his said daughter) leaves the residue of his property between them in equal shares.—*City Press.*

Great Indian Peninsular Railway Terminus, Bombay.—The central keystone of the large masonry dome of the above buildings was fixed on Jubilee day, the 20th of June, thus bringing this large work to another stage nearer completion. The event was signalised by the contractors, Messrs. Burjoijee Rustomjee, Maistry, & Co., having a ceremony, and presenting their sub-contractors, head maistries (foremen), with presents of handsome shawls, turbans, and money, the usual native method of appreciating services rendered when any great work has been practically completed. The dome, which is 45 ft. clear span, is entirely of cut-stone masonry, and has been constructed without any centering or supports whatever. The whole of the interior masonry construction of the dome is exposed to view, and covers the grand staircase and hall. Now that the keystone has been fixed there only remain the embellishments of the interior and exterior, such as the mouldings, carvings, and statuary. The dome will be terminated by a colossal figure of "Progress" in Bath stone. The buildings will in all probability be completed by the beginning of next year. The statue of H.M. the Queen-Empress, representing the State, the railway being guaranteed by Government, will be placed under the canopy in the central gable of the building. The cost of the terminal buildings when completed will be 27 lacs of rupees, or 250,000*l.* They were designed by Mr. F. W. Stevens, late of the Public Works Department, and are being carried out by that officer with the assistance of Mr. Siteram Khanderim, assistant engineer. The sculpture for the buildings has been executed by Messrs. Earp & Son, of Lambeth.

Another Interoceanic Railway.—The contract for the construction of another important interoceanic highway has just been concluded. It is proposed to construct a railway in Guatemala, to extend from Santa Tomas, on the Atlantic seaboard, to the Pacific Ocean, a distance of 275 miles. The new railway is to be in operation in eighteen months. The scheme was postponed in consequence of the death of President Barrios, but negotiations between representatives of Guatemala and two American contractors, Mr. Charles Mackin and Mr. J. H. McCreery, have been concluded in New York, and the necessary funds provided. Guatemala is the richest coffee country in the world, and an interoceanic railway, such as is projected, means a curtailing of the route to California by over 2,000 miles. In renewing negotiations for the railway, the Government has made some very valuable concessions. By the terms of the present contract the contractors are to receive 50,000 dols. per mile in gold-bearing government bonds, 5,000 dols. in gold per mile, and a grant of 280,000 acres of land along the line of the road, the route of which the contractors can select themselves. Of the bond issue, 6,000,000 dols. worth are stated to have already been assured of sale in Paris,—enough to ensure the completion of the line. Of the land conceded, General Queralta, who will be in charge of the construction, states that no less than 30,000 acres of it are in rubber trees, and the remainder is rich in mahogany, rosewood, and other valuable woods. Last year Guatemala exported 80,000,000 pounds of coffee, and the trade is susceptible of rapid expansion.—*Iron.*

Chubb's Push and Pull Locks.—On the 8th instant an interlocutory application was made on behalf of the plaintiff in the case of Kaye *v.* Chubb to the Master of the Rolls (Lord Esher) and Lords Justices Lindley and Lopes, for a stay of proceedings in the action pending an appeal to the House of Lords. When the action was tried, Mr. Justice Mathew decided in favour of the plaintiff; but in the Court of Appeal their lordships gave judgment with costs in favour of the defendants, Messrs. Chubb, lock and safe manufacturers. The plaintiff having entered a further appeal to the House of Lords, now applied for a stay of execution pending the result of such appeal. After hearing the arguments, however, their lordships refused the application with costs.

Numidian Marble.—Our columns have of late contained several references to Numidian marbles, which, owing to their richness and beauty, are beginning to be used in modern buildings in this country. In our advertisement columns will be found the prospectus of a company which has been formed to work the Numidian quarries, which are stated to be practically inexhaustible.

A New Public Hall at Mitcham.—A new Vestry-hall, which is also intended to serve the purposes of a public hall for meetings and general entertainments, has just been erected and opened at Mitcham. The land upon which it has been erected is on an open and central situation overlooking Mitcham Green, and the principal frontage of the building to the high road from Mitcham to Sutton. The building is in the "Queen Anne" style, the materials used being red brick, with patent red-brick window heads and bands, and Shawk stone dressings, entrances, and cornice. The principal frontage, facing Mitcham Green, is 80 ft. in length, the height of the cornice being 40 ft., and to the ridge of the high-pitched roof 60 ft. At the north-east corner a clock tower, in which there is an illuminated clock and a peal of bells, rises to a height of 80 ft., and in a central position, above the summit of the roof, there is a ventilating *flèche* rising to the same height as the tower. The building is isolated, the north and south return frontages being 35 ft. in length, and the west frontage of the same length as the principal elevation to the east. The ground-floor contains a committee-room and three offices, one of which forms the general office for the business of the parish of Mitcham, the other two offices being let to the Croydon Sanitary Authority. The upper floor contains a public-hall, 58 ft. in length and 31 ft. in width, and is 32 ft. in height to the apex of an open timber roof, in which there are three central outlets connected with the ventilating *flèche*. In the walls are also inserted Benham's ventilating inlets. The hall will seat an audience of about 400 persons. At the south end there is a moveable platform or stage. In connexion with the hall there are retiring and cloak rooms. The architect of the building, which has cost about 3,500*l.*, is Mr. R. M. Chart, and the contractor was Mr. E. J. Burnand, of Wallington. It may be added that the building has been erected on the site of the old stocks and "cage," which were removed for the purpose.

Sale of a Building Estate in Kent.—On Thursday in last week the first portion of a building estate, situated on Swanley Hills, in Kent, was offered for sale by Messrs. Baker & Sons. It is known as the Rowzill Estate, comprising about 15 acres, and has been laid out for the erection of upwards of 250 houses and shops, five new roads, each 50 ft. in width, having been formed on the estate. It is about a mile and a half distant from the Swanley Junction of the London, Chatham, and Dover Railway, and nearly two miles from the Crayford Station of the South-Eastern line. It stands upon high ground, commanding extensive views of the county of Kent for several miles around. The number of plots offered was 166, being nearly two-thirds of the entire number of plots on the estate, twelve being shop plots, and one a hotel plot. Before inviting offers, Mr. Baker, the auctioneer, reminded the company present that the whole of the plots to be submitted would be sold without the slightest reserve for whatever they might fetch, it being the object of the vendor to offer every encouragement for the immediate commencement of building on the property. He added that the purchasers of the several lots would have conveyances made to them free of expense except the stamp duty. On the sale commencing, the whole of the plots were rapidly sold, several purchasers taking as many as six and twelve plots each. The plots for the erection of private houses, having frontages of 16 ft., and depths of about 70 ft., were sold at from 3*l.* to 4*l.* each, whilst the shop plots, having frontages of 18 ft., and depths of about 80 ft., realised from 6*l.* to 8*l.* each. The hotel plot, having a frontage of 54 ft. to Claremont-road (the main road to London), and a return frontage of 80 ft., was sold for 45*l.*

Andover.—The Mansion of Enham-place, near Andover, belonging to the late Colonel Earle, which was destroyed by fire four years ago, is about to be re-built by his brother, Mr. Thomas Hughes Earle, Clerk of the Peace for Hants. Except by the incorporation of the old cellars, the house will be erected from entirely new plans, by Mr. Samuel Knight. The style adopted is Italian, Classic in its detail, but with high-pitched tile roofs, tall chimneys, and otherwise Jacobean features. The elevations in red brick and Ham-hill stone. The general contract has been entered into with Messrs. Stephens, Bastow, & Co., of Bristol.

Carved Statuary Marble Mantelpieces for Melbourne.—We have had an opportunity of inspecting, at the show-rooms of Messrs. George Wright & Co., 155, Queen Victoria-street, one of a pair of large and handsome mantelpieces executed by that firm for the drawing-room of a new mansion at Melbourne for Sir William Clarke, Bart. The mantelpieces are Renaissance in style. The fireplace or opening is 4 feet wide, with deep splays lined with large and very good hand-painted tiles. The cast-iron dog-grate has nickel bars, and the "dogs" are of hollow cast brasswork, pierced and burnished, the supports for the fire-irons being of the same material, similarly treated. The piers of the mantelpiece are 18 in. wide. The height to the top of the shelf (which is 21 in. wide) is 5 ft. 7 in. The shelf, which is richly moulded, is supported by carved consoles, in their turn supported by diminishing pilasters. The frieze is broadly treated, and has in the centre a shield supported by two cherubs—rather too sedate of feature, perhaps. On each side of these is a "swag" of roses and leaves, and smaller "swags" are looped round the consoles which support the mantelshelf. The workmanship is very creditable. The show-rooms of this firm, we may add, are well worth visiting, for, among other specialties, they contain a new tile-canopied dog-grate which, while excellent in appearance, seems to be well calculated to prevent the smoky chimneys too often resulting where dog-grates are used.

Handy Reference Books for the Office. "May's British and Irish Press Guide for 1887" (London: F. L. May & Co., 159, Piccadilly) is a compact and well-arranged handy-book, and that its merits are appreciated evidence is afforded by the fact that this is its fourteenth year. It is what it claims to be, "a classified, concise, and comprehensive index to the Press of the United Kingdom," and it also includes a list of the principal Colonial and foreign journals. We can cordially recommend it. It is published at 1s.——Another work of a reference of a kindred character, but with some special features superadded, is "Sell's Dictionary of the World's Press for 1887" (London: H. Sell, 167, Fleet-street). Of this work we are able to say, after careful examination, that, on the whole, it is perhaps the most complete reference-book of its kind,—as, indeed, it ought to be, taking its bulkiness into consideration. With one or two exceptions which we have noticed, it appears to be very accurate and quite up to date. It gives lists of foreign journals, as well as those of Great Britain and Ireland, and a large mass of matter interesting to all who buy, read, or advertise in papers,—in other words, to everybody. It claims to be the largest 2s. book ever published.

A Memorial Pulpit has been erected in Sparkwell Church, Plympton, South Devon, of which the Rev. Pender H. Cudlip is the vicar. It was designed by the Rev. E. Geldart, of Little Braxted, Witham, Essex. The base is of freestone, and the superstructure in English oak, with traceried and carved panels and cornices; he central panel contains a sculptured figure of St. John the Baptist, in high relief, standing on a carved corbel, and a riband over the figure bearing the words "Bring forth fruits of penance" carved thereon. A "brass" inserted in one of the panels bears the following inscription in Old English text:—"In loving memory of Vice-Admiral George Woollcombe, of Hemerdon, died 3rd July, MDCCCLXV., aged 70, and of Mary Elizabeth Woollcombe, his wife, died 26th Jany., MDCCCLXXXIII., aged 81. Erected by Major and Mrs. Robert Woollcombe." The whole of the work has been executed by Messrs. Luscombe & Son, of Exeter.

St. George's-in-the-East Workhouse.—The Report of the Local Government Board Inspector (Dr. Brydges) upon the recent additions to this establishment has been laid before the Guardians. It states that the new workhouse block (Messrs. Wilson, Son, & Aldwinckle, architects) is all that could be desired as regards drainage, warmth, and ventilation, which is on the Boyle system. On the occasion of Dr. Brydges' visit, the Workhouse was full of people, but we are informed that the air was remarkably pure. The report was referred to the House Committee for consideration.

National Gallery Alterations.——We are asked to mention that the material of the steps in the new work is from the Craigleith quarries.

The Banner Sanitation Company has recently issued a very concise and instructive catalogue, entitled "The Sanitarian's Companion." It is not confined to the Company's own well-known specialities, but includes specialities of other makers, so that, in short, it forms a complete conspectus of the best modern practice in sanitation and sanitary fittings. It is not overloaded with a multiplicity of detail, but shows at a glance typical specimens of the best kind of fittings and apparatus for varying requirements. The Company a year ago opened excellent show-rooms at Wessex House, Northumberland-avenue (opposite the Hôtel Métropole), where may be seen in action a great many of the appliances figured and described in the catalogue. We would specially call attention to Banner's patent "drain grenade" or "drain ferret," a small tube of thin glass charged with pungent and volatile chemicals. When one of these "grenades" or "ferrets" is dropped down any pipe, it breaks, and the odour of its contents can, with necessary precautions, be confined within any particular section of a house-drainage system which may be suspected of allowing the escape of sewer-gas. The advantages of enclosing the chemicals in glass are obvious. Among valve-closets figured in the catalogue is the "Nestor," the special feature of which is that the trap of the overflow is formed by the water in the basin itself, and therefore cannot be unsyphoned, nor is it likely to get choked, for the water in the overflow-pipe is necessarily changed each time the closet is used. The catalogue also includes particulars of a very efficient and cheap "washout" closet.

Upper Helmsley.—A consistory court was recently held at York Minster, before a surrogate to Lord Grimthorpe, when a faculty was decreed to the Rev. G. J. Horner, rector of Upper Helmsley, and Colonel G. E. Herbert, churchwarden, for the carrying out of what are described as improvements at the parish church. It is proposed to re-roof the edifice, and to build new chancel, porch, vestry, and heating-chamber. Internal alterations are also to be made, the church being reseated and refitted, and other desirable improvements effected. The plans are being prepared by Messrs. William Lewis & Son, architects, York.

Paper Doors.—Paper doors are coming into use in America, and it is not difficult to foresee that, should they answer requirements, they will soon be introduced in Europe. It is said that they compare favourably with those of wood, as they neither shrink, swell, crack, nor warp. The doors are formed of two thick paper boards, stamped and moulded into panels, and joined together with glue and potash, and finally rolled through heavy rollers. After being covered with a waterproof coating, and with another which is fireproof, the doors are painted, varnished, and hung in the usual way.

George Neal & Co. (Limited).—Our advertisement columns this week contain the abridged prospectus of a company which has been formed to acquire, as a going concern, and to further develope, the business,—well known throughout the whole of the Metropolis,—of Mr. George Neal, of Wandsworth and Battersea, lime, cement, and brick merchant, wharfinger, ballast, tar-paving, and general contractor and carman, started by the late Mr. Robert Neal as far back as 1826.

Arbitration in re the Sheffield Sewerage Works.—The Sewerage and Rivers Committee of the Sheffield Town Council have recommended that the corporate common seal be affixed to the appointment of Mr. C. J. Innocent, architect and surveyor, as single arbitrator to settle the amount of compensation to be paid to Mr. David Ward, "for the loss and damage alleged to have been sustained by him in respect of his property at Walkley Bank, by reason of the construction of certain works of sewerage."

Preservation of Stone.—In reference to our recent articles on this subject, a correspondent writes:—"About twenty years ago two houses were built in Ashley-place, the exterior being formed of brick and Bath stone dressings; the stonework was, on completion, covered with Ransome's silicate, which has preserved the stone from any decay whatever."

Upton (Essex).—The new church for the Franciscans, at Upton (Essex), is now being built from the designs of Messrs. Pugin & Pugin. The contractor is Mr. James Morter, of Stratford.

Parish of St. Mary Magdalen.—The Commissioners appointed *ad hoc* recommend in their report that the contemplated union of the parishes of St. Mary Magdalen, Old Fish-street, and St. Gregory-by-St. Paul with that of St. Martin-by-Ludgate, should be carried out forthwith. An income of 570*l.* per annum will be paid to the rector of the new benefice, and the proceeds of the sale of the site of St. Mary Magdalen, in Knightrider-street (the church having been lately destroyed by fire), will be devoted towards the building of a new church in London.

Architectural Lectures.—The lectures on Style and Styles in Building, to be delivered by Mr. Harvey at the Guilds' Institute, will begin on the 19th inst. The fee for the whole course is 5*s.* Applications for tickets and syllabus to be addressed to the Secretary of the City and Guilds of London Institute, Exhibition-road.

Linlithgow.—The new Catholic church at Linlithgow, designed by Messrs. Pugin & Pugin, has just been commenced. It is being built in memory of Mary, Queen of Scots.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	5	10	0	7	10	0
Teak, E.I. ....load	8	0	0	12	0	0
Sequoia, U.S. ....foot cube	0	3	3	0	3	0
Ash, Canada ....load	3	0	0	4	10	0
Birch ,, ...	2	0	0	3	10	0
Elm ,, ...	3	10	0	4	10	0
Fir, Dantsic, &c.	1	10	0	4	0	0
Oak ,, ...	2	10	0	4	10	0
Canada	3	0	0	6	0	0
Pine, Canada red	2	0	0	3	10	0
,, yellow	2	10	0	4	10	0
Lath, Dantsic ....fathom	3	0	0	5	0	0
St. Petersburg	4	0	0	5	10	0
Wainscot, Riga ....log	0	0	0	0	0	0
,, Odessa, crown....	2	10	0	3	0	0
Deals, Finland, 2nd and 1st...std.100	7	0	0	8	0	0
,, 4th and 3rd	5	10	0	6	10	0
Riga	5	10	0	7	0	0
St. Petersburg, 1st yellow	8	0	0	13	0	0
,, 2nd ,, ...	7	0	0	8	0	0
,, white	6	10	0	8	10	0
Swedish	0	0	0	0	0	0
White Sea	7	0	0	16	0	0
Canada, Pine, 1st	16	0	0	24	0	0
,, ,, 2nd....	10	0	0	15	0	0
,, ,, 3rd, &c....	6	0	0	9	0	0
,, Spruce, 1st	8	0	0	9	0	0
,, ,, 3rd and 2nd	5	0	0	7	0	0
New Brunswick, &c....	5	0	0	6	10	0
Battens, all kinds	4	0	0	10	10	0
Flooring Boards, sq., 1 in., prepared, First	0	8	0	0	11	0
Second	0	6	6	0	7	6
Other qualities	0	4	0	0	6	0
Cedar, Cuba ....foot	0	0	3½	0	0	3½
Honduras, &c.	0	0	3	0	0	3½
Australian	0	0	3	0	0	3
Mahogany, Cuba	0	0	4	0	0	7
St. Domingo, cargo average	0	0	4	0	0	6
Mahogany, Mexican, cargo av.....	0	0	3½	0	0	4
Tobasco ,, ...	0	0	4	0	0	5½
Honduras ,, ...	0	0	3½	0	0	5½
Maple, Bird's-eye	0	0	5	0	0	7
Rose, Rio ....ton	8	0	0	11	0	0
Bahia....	7	0	0	9	0	0
Box, Turkey ....ton	5	0	0	12	0	0
Satin, St. Domingo ....foot	0	0	5	0	0	9
Porto Rico	0	0	6	0	0	10
Walnut, Italian	0	0	3½	0	0	5½

METALS.						
IRON—Bar, Welsh, in London...ton	4	7	6	4	15	0
,, ,, in Wales	4	2	6	4	7	6
,, Staffordshire, London	5	10	0	6	0	0
Sheets, single, in London	6	15	0	8	10	0
Hoops ,, ...	6	0	0	7	0	0
Nail-rods ,, ...	5	15	0	6	10	0
COPPER—						
British, cake and ingot ....ton	43	0	0	44	0	0
Best selected	44	10	0	45	0	0
Sheets, strong....	50	0	0	0	0	0
Chili, bars	39	15	0	40	2	6
YELLOW METAL ....lb.	0	0	0	0	0	0
LEAD—						
Pig, Spanish ....ton	11	16	3	0	0	0
English, common brands....	12	2	6	0	0	0
Sheet, English	13	1	3	13	6	3
SPELTER—						
Silesian, special ....ton	14	12	6	14	15	0
Ordinary brands....	14	10	0	14	12	6
TIN—						
Straits....ton	103	17	6	0	0	0
Australian	104	10	0	0	0	0
English ingots	107	0	0	0	0	0
ZINC—						
English sheet ....ton	0	0	0	0	0	0

OILS.						
Linseed ....ton	21	15	0	22	0	0
Cocoanut, Cochin	30	0	0	33	0	0
Ceylon	24	5	0	0	0	0
Palm, Lagos	21	10	0	0	0	0
Rapeseed, English pale	23	15	0	24	0	0
,, brown	22	5	0	22	10	0
Cottonseed, refined	21	10	0	22	0	0
Tallow and Oleine	25	0	0	45	0	0
Lubricating, U.S.	5	0	0	6	0	0
,, refined	5	0	0	12	0	0
TURPENTINE—						
American, in casks ....cwt.	1	7	3	1	7	6
TAR—						
Stockholm ....barrel	0	14	0	0	14	6
Archangel	0	9	6	0	10	6

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
Masonic Building	Masonic Buildings Co.	Not stated	August 1st	ii.
Laying-out Property, Isle of Man	.....	35*l.* and 15*l.*	Not stated	ii.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Materials for Macadam	Brighton Town Council	P. C. Lockwood	July 19th	xii.
Making-up and Paving Roads	Wandsworth Bd. of Wks	*Official*	do.	ii.
Barging away Material	Hammersmith Vestry	do.	July 20th	xii.
Asphalte and Wood Paving	St. Martin-in-the-Fields' Vestry	do.	July 21st	ii.
Painting, Repairs, &c.	Lewisham Union	do.	do.	ii.
Cast-Iron Crown Plates	Level of Romney Marsh	H. D. Good	July 22nd	ii.
Coast Guard Station	Admiralty	*Official*	do.	ii.
Detached Infirmary, Llandaff	Drapers' Company	C. Reilly	July 25th	ii.
Supply of Broken Granite and Flints, &c.	Southgate Local Board	*Official*	July 26th	xii.
Granite Carriageways, &c.	Met. Board of Works	do.	July 29th	ii.
Construction of Railways (Beeston to Batley)	Great Northern Ry. Co.	J. Fraser & Sons	do.	xii.
Cemetery Buildings	Fareham Local Board	*Official*	do.	xii.
Roads and Drainage to Cemetery	do.	do.	do.	xii.
Sewerage Works	Allerton U. S. A.	B. Latham	July 30th	ii.
Broken Granite	Harrow Local Board	*Official*	do.	xii.
Fire-Engine Station and Public Office	do.	C. F. Hayward	August 2nd	xii.
Main Sewerage Works	Hailsham Union	C. O. Blaber	do.	ii.
Sea Water Works, Storm Outfall, &c.	Bournemouth Comssnrs	G. R. Andrews	August 8th	ii.
Sewerage Works	E. Grinstead Local Bd.	E. S. Gordon	August 15th	ii.
Iron School Buildings	Schl. Board for London	*Official*	Not stated	ii.
Erection of New Buildings, &c.	Aston Union	Dunn & Hipkiss	do.	xii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Surveyor	Oldbury Local Board	Not stated	July 21st	xvi.
Surveyor's Clerk	St. George's, Hanover-square, Vestry	2*l.* 12*s.* 6*d.* weekly	do.	xvi.

TENDERS

CHESHUNT.—For drainage works for the Cheshunt Local Board. Messrs. Gotto & Beesley, engineers:—

Contract No. 1.—Iron Pipes and Manholes.

Edington & Sons	£6,973 0 0
Lowery & Co.	6,614 0 0
Dickenson & Son	6,205 0 0
Smith, Patterson, & Co.	6,087 0 0
Neave	5,923 0 0
J. & S. Roberts	5,747 0 0
Hilton & Son	5,707 0 0
Jukes, Coulson, & Co.	5,627 0 0
Cochrane & Co., Dudley	5,574 0 0
Firmstone & Bros.	5,514 0 0
Stanton Ironworks Co.	5,368 0 0
Cochrane, Grove, & Co. (accepted)	5,003 0 0

Contract No. 2.—Steam Engines, Boilers, and Pumps.

Gwynne & Co.	£3,693 0 0
Crossley	2,354 0 0
J. Watt & Co.	1,780 0 0
Grant	1,750 0 0
Tangyes	1,740 0 0
Stott & Co.	1,694 0 0
Scott & Son	1,641 0 0
Owen & Co.	1,600 0 0
G. Waller & Co.	1,586 0 0
J. Warner & Son	1,550 0 0
Bird	1,550 0 0
Easton & Anderson	1,450 0 0
Kirk & Co.	1,440 0 0
Willdigg Bros.	1,420 0 0
Hainsworth	1,354 0 0
Thornwell & Warham	1,346 0 0
Coalbrookdale Co.	1,320 0 0
Silvester & Co.	1,315 0 0
Glenfield	1,305 0 0
Abell	1,250 0 0
Allchin	1,210 0 0
Parker	1,200 0 0
Bever & Dorling	1,181 0 0
Lilleshall Co. (accepted)	1,125 0 0
Dodman	940 0 0
Cowlishaw	788 0 0

Contract No. 3.—Sewers and Buildings.

Webster	£31,776 0 0
Bruce & Co.	29,056 0 0
Bugbird	23,878 0 0
Cooke & Co.	20,900 0 0
Hilton & Son	20,500 0 0
Bottoms	20,400 0 0
Dickenson	19,990 0 0
Nicholls	19,935 0 0
Bell	19,690 0 0
Bentley	19,550 0 0
Adams	18,672 0 0
Innes & Wood	18,200 0 0
Neave & Co.	17,883 0 0
Robson	17,846 0 0
Lowery & Co.	17,300 0 0
J. Dickson (accepted)	16,333 0 0
Edmondson	16,325 0 0

DEAL (Kent).—For building new retort-house for the Deal and Walmer Gas Company:—

Cottew, Deal	£746 0 0
W. & T. Denne, Walmer	692 0 0
Trollope, Walmer	688 0 0
Denne & Son, Deal	647 0 0
Wise, Deal (accepted)	645 0 0

BOURTON (Somerset).—For new laundry, for the Guardians of Bedminster Union. Mr. J. A. Sharp, engineer and surveyor:—

Building.

J. Child, Bourton	£360 0 0
J. James, Bristol	349 0 0
C. N. Hayes, Bristol	286 0 0
N. J. Beaven, Bristol (accepted)	280 0 0
J. Bastow, Bristol	275 0 0

Fittings.

Llewellyn & James, Bristol	278 15 0
J. Childs, Bourton	270 0 0
J. B. May, London	240 0 0
J. S. Leary, Bristol	235 0 0
N. J. Beaven, Bristol (accepted)	230 0 0
W. J. Pope, Bristol	215 0 0

EASTBOURNE.—For alterations to No. 8, Cornfield-road, for Mr. Easton. Messrs. Fuller & Oakden, architects, Eastbourne:—

G. Gravett	£132 0 0
J. Noakes	105 0 0
Dove & Son	97 10 0
M. Martin	87 12 0

[All of Eastbourne.]

EASTBOURNE.—For alterations to No. 13, Ashford-road, for Mr. J. A. Provost. Messrs. Fuller & Oakden, architects, Eastbourne:—

J. Martin	£142 0 0
Martin	141 0 0
Dove & Son	83 0 0

[All of Eastbourne.]

ESHER.—For the Esher and Ditton sewerage works, pumping-station, machinery, &c. Mr. B. Latham, C.E., F.G.S., engineer:—

B. Cooke & Co. (accepted)	£10,841 0 0

FOREST-HILL.—For alterations and additions to banking premises, for the Directors of the London and South-Western Bank. Messrs. Tolley & Son, architects. Quantities supplied:—

Whitewick & George, Forest-hill	£1,853 10 0
A. Smith, Forest-hill	1,730 0 0
Smith & Sons, Norwood Junction	1,667 0 0
C. J. Bowyer, Upper Norwood	1,621 0 0
T. Roberts, Forest-hill	1,610 0 0
Bryan, Norwood Junction	1,579 0 0
J. Waddington, Sydenham (accepted)	1,574 0 0

GATESHEAD.—For two houses in Derwentwater-road, Gateshead, for Mr. M. Turner. Geo. W. Caris, architect, No. 16, West-street, Gateshead:—

Haswell & Waugh	£480 0 0
Greason Bros., Gateshead	460 0 0
F. Briggs, Gateshead	455 0 0
R. Henderson, Low Fell	440 0 0
F. Wakefield, Gateshead	430 0 0
Greetham Bros., Gateshead	430 0 0
T. Watson, Gateshead (accepted)	380 10 0

GIPSY-HILL.—For new wing and additions to the Bungalow, for Mr. H. H. Macleod. Mr. Marshall N. Inman, architect, 7, Bedford-row, W.C.:—

W. Poole	£477 10 0
W. Fox	476 0 0
J. Hitchcock (accepted)	469 15 0

GRIMSBY.—For alterations and additions to the *Grimsby News* Offices and Printing Works, for the Directors. Mr. E. W. Farebrother, architect:—

Walker & Cook (accepted)	£290 5 0

GRIMSBY.—For the erection of a factory for the Grimsby Fish Biscuit Company, Limited. Mr. E. W. Farebrother, architect:—

W. H. Smith	£2,090 0 0
Roebuck & Gooseman	1,808 0 0
J. & R. G. Guy	1,750 0 0
Riggall & Hewins	1,657 10 0
T. Simonson (accepted)	1,590 0 0

For Boilers, Setting, &c., and Extra Timber for Foundations.

T. Simonson and H. Marrows (accepted)	£217 0 0

For Fencing in Site.

Riggall & Hewins	£99 10 0
H. Marrows (accepted)	97 0 0
Jolland Chapman	70 0 0

GRIMSBY.—For additions to the Corporation Ice Works, Grimsby. Mr. E. W. Farebrother, architect:—

Nightingale & Danby	£580 0 0
Roebuck & Gooseman	488 0 0
J. & R. G. Guy	480 0 0
Riggall & Hewins (accepted)	423 0 0

GRIMSBY.—For new shop, Victoria-street, for Mr. Drakes. Mr. E. W. Farebrother, architect:—

Roebuck & Gooseman	£101 2 6
Frank & Jagger	97 0 0
Nightingale & Danby	92 10 0
H. Marrows (accepted)	72 0 0

GRIMSBY.—For alterations and additions to Spring Church Schools, for the Trustees. Mr. E. W. Farebrother, architect:—

W. H. Emerson	£389 0 0
Roebuck & Gooseman	376 0 0
W. Kirk	372 0 0
Thomas Swain	366 0 0
G. Betts	353 0 0
Thos. Simonson	333 0 0
F. Grant (accepted)	280 5 11

GRIMSBY.—For additions to Holme Hill Schools, for the Grimsby School Board. Mr. E. W. Farebrother, architect:—

Roebuck & Gooseman	£293 5 8
J. & R. G. Guy	290 0 0
Riggall & Hewins	270 0 0
Thos. Simonson (accepted)	231 0 0
Walker & Cook	222 10 0

GRIMSBY.—For additions to South Parade Board Schools, for the Grimsby School Board. Mr. E. W. Farebrother, architect:—

Walker & Cook	£465 10 0
Roebuck & Gooseman	465 0 0
Riggall & Hewins	463 10 0
J. & J. G. Guy	463 0 0
Geo. E. Thompson	443 10 0
Thos. Simonson (accepted)	435 16 0

GREENSTED (Essex).—For new buildings and repairs at New House Farm, Greensted, for the Trustees of the Budworth Estate. Mr. Thomas Milbourn, architect:—

Noble, Ongar	£625 17 0
H. & E. Lea, London	489 0 0
Patman & Fotheringham, London*	441 11 0
Barlow, Ongar	432 0 0

* Accepted.

HENDON.—For addition to house, for Sir Theodore Brinckmann, Bart. Messrs. Buckland & Sons, surveyors:—

Donne, Hendon	£428 0 0
E. A. Roome, Clapton (accepted)	400 0 0

HOLLESLEY.—For additions to the Red House, Hollesley, for the Colonial College and Training Farms. Messrs. John Giles, Gough, & Trollope, architects. Quantities by Mr. C. H. Goode:—

Girling, Ipswich (accepted)	£2,350 0 0

HORNSEY.—For the erection of a caretaker's cottage, at Irish-corner, also for the construction and erection of two street fire stations, for the Hornsey Local Board. Mr. T. de Courcy Meade, engineer:—

Caretaker's Cottage.

Smith & Sons, Muswell Hill	£487 0 0
Holmes & Son, Highgate	469 0 0
Marks, Crouch End	465 9 3
Wheeler & Co., North Finchley	458 0 0
Price, Brixton	403 0 0
Dixon, Highgate	397 0 0
King Bros., South Norwood	359 0 0
Kerry & Son, Highgate	350 0 0
Kessells, Highgate	349 0 0
Mattock Bros., Finsbury Park	345 0 0
Paine Bros., Stamford Hill*	323 19 11
Linzell, Bedford-row, W.C.†	315 0 0

* Accepted. † Withdrawn.

Street Fire Stations.

	Station A.	Station B.
Rosser & Russell, Charing-cross	£222 0 0	£177 0 0
Kerry & Son, Highgate	177 0 0	136 0 0
Holmes, Highgate	172 0 0	134 0 0
Dixon, Highgate	165 0 0	140 0 0
Marks, Crouch End	156 15 0	141 17 6
Keay, Birmingham	105 0 0	130 0 0
Cutting & Co., Strand*	95 0 0	89 10 0
Linzell, Bedford-row†	68 0 0	48 0 0

* Accepted. † Withdrawn.

HOXTON.—For rebuilding house and shop in the East-road, for Mr. T. Potter. Mr. Ernest Newton, architect:—

E. A. Roome, Clapton (accepted)	£760 0 0

KINGSTON-ON-THAMES.—For new shop front, &c., at No. 35, Market-place, for Charles D. Hodgson, Esq. Mr. T. C. Barralet, architect, Bridge-chambers, Richmond. Quantities supplied:—

Lane	£285 0 0
Havell	279 10 0
Henley & Son	273 18 0
Judd	256 0 0
Carman (accepted)	239 0 0

LEICESTER.—For the erection of shop and warehouse, Belgrave-gate, Leicester, for Messrs. W. H. Staynes & Smith, leather merchants. Mr. R. J. Stephens, architect, Belvoir-street, Leicester:—

Clark & Garrett	£3,349	0	0
Hutchinson	3,236	0	0
Elliott	3,160	0	0
Tyers & Gates	3,100	0	0
Wood, Derby (accepted)	3,038	0	0
Jewsbury	2,998	0	0
Kellett	2,970	0	0
Holmes	2,921	18	0
Stevens	2,897	10	0
Duxbury	2,819	0	0
Harrison	2,815	0	0

LEWES.—For detached villa residence, St. Anne's, for Mr. F. A. Drake. Messrs. Fuller & Oakden, architects, Eastbourne:—

J. Martin, Eastbourne	£1,980	0	0

LONDON.—For painting and decorating the reception-room and other rooms of the principal floor of the Royal Society, Burlington House. Messrs. D. Ruddle & Son, architects and surveyors, Montague-chambers, Bedford-street, Strand:—

Marchant, Lady Somerset-road, N.W. (accepted)	£118	10	0

LONDON.—For painting and cleaning for the School Board for London:—

Angler's Gardens Schools.

McCormack	£113	0	0
T. W. Smith	96	0	0
E. Green	95	18	0
Grover & Son	95	10	0
Dearing & Son	92	0	0

Bowman's-place Schools.

Kirby & Chase	£371	0	0
Williams & Son	312	0	0
Fleming	310	0	0
Goodman	274	0	0
Stevens Bros.	273	0	0
Vigor & Co.	273	0	0
Flaxman	264	0	0
T. W. Smith & Son	239	0	0
Knight & Walden	226	0	0
Dearing & Son	210	0	0

Curtain-road Schools.

Steel Bros.	£169	0	0
E. Green	168	0	0
Williams & Son	149	0	0
Rogers & Teadon	129	15	0
Johnson & Co.	119	0	0
Pritchard & Son	113	10	0
Dearing & Son	108	0	0
G. Flaxman	97	0	0
Hayworth & Son	93	0	0

Shepperton-road Schools.

E. Green	£114	0	0
McCormack & Son	110	0	0
T. W. Smith & Son	108	0	0
Grover & Son	95	10	0
Dearing & Son	92	0	0
Willmott	84	10	0

LONDON.—For new stabling, Cottage-place, Sloane-street, S.W., for Mr. D. Vigo. Mr. J. G. H. Buckmaster, architect, 28, Cadogan-place:—

Rayment & Son	£1,570	0	0
Turrell	1,569	15	9
Holloway	1,489	0	0
Stimpson & Co.	1,470	0	0
Oldrey & Co.	1,417	0	0
Garlick	1,374	0	0
W. Gladding (accepted)	1,314	0	0

LONDON.—For the erection of an additional block of dwellings in North-row, for the St. George's, Hanover-square, Workmen's Dwellings Association. Mr. R. H. Burden, architect. Quantities by Mr. Rookwood:—

Simpson & Son	£13,890	0	0
Holland & Hannen	13,870	0	0
Macey	13,718	0	0
Patman & Fotheringham	12,996	0	0
Killby & Gayford	12,836	0	0
Bywaters	12,673	0	0
Scrivener	12,618	0	0
Higgs & Hill (accepted)	12,300	0	0

LONDON.—For works to house and shop, No. 172, Kentish Town-road. Mr. E. W. Poley, architect, 6, Duke-street, Adelphi:—

	Shop. £. s. d.	House. £. s.	Total. £ s. d.
James & Sons, Landel's-road, East Dulwich	156 5 0	... 135 10	... 291 15 0
J. R. Lacey, Rochester-terrace, N.W.	164 0 0	... 124 10	... 288 10 0
Scharien & Co., Gloucester-terrace, S.W.	123 10 0	... 109 0	... 232 10 0
G. Arthur, Dale-road, Kentish Town	127 10 0	... 82 10	... 210 0 0
F. Mitchell, Peckham Park-road, S.E.	122 18 6	... 72 10	... 195 8 6
T. Collins, Regina-road, Finsbury Park	107 5 0	... 72 0	... 179 5 0
Groome & Fuller, 232, New North-road*	90 0 0	... 79 10	... 169 10 0

* Accepted conditionally.

NEWPORT (Mon.).—For alterations to premises, No. 138, Commercial-road, for Mr. G. Harries. Messrs. W. G. Habershon & Fawckner, architects:—

T. Cook	£410	0	0
G. F. Sharrum	410	0	0
E. Richards	347	0	0
Martin	337	0	0
Moulton & Brownscombe	328	0	0
Morris	267	0	0

[All of Newport.]

NEWPORT (Mon.).—For reconstruction of business premises, Commercial-street, for Mr. Bear. Messrs. W. G. Habershon & Fawckner, architects:—

C. Miles	£1,042	0	0
J. Linton	999	0	0
W. Blackburn	989	0	0

[All of Newport.]

NEWPORT (Mon.).—For new corn-stores, warehouse, &c., Skinner-street, for Mr. S. Smith. Messrs. W. G. Habershon & Fawckner, architects, Newport:—

L. B. Moore, Newport	£1,650	0	0
T. Goldsworthy, Newport	1,620	0	0
Moulton & Brownscombe, Newport	1,525	0	0
H. Parfitt, Newport	1,500	0	0
W. Price, Newport	1,489	0	0
C. Miles, Newport	1,472	0	0
G. Wilkins, Newport	1,457	0	0
W. Blackburn, Newport	1,435	0	0
J. Linton, Newport	1,400	0	0
The Executors of William Gradwell, Barrow-in-Furness and Newport	1,320	0	0

NEWPORT (Mon.).—For reconstruction of premises, Nos. 195 and 196, Commercial-road, for Mr. Pell. Messrs. W. G. Habershon & Fawckner, architects:—

E. Richards	£883	10	0
Moulton & Brownscombe	812	10	0
G. Wilkins	770	0	0
W. Blackburn	755	0	0
Morris	700	0	0

[All of Newport.]

OXFORD.—For the erection of Mansfield College, Oxford. Mr. Basil Champneys, architect:—

Castle	£33,849	0	0
Kingerlee	30,733	0	0
Lovatt	30,517	0	0
Brown, Son, & Co.	29,090	0	0
Bell & Son	29,381	0	0
Cowlin & Son	28,773	0	0
Dove Bros.	28,522	0	0
Franklin	27,954	0	0
Symons	27,948	0	0
Estcourt, Gloucester	27,449	0	0
Horsman, Wolverhampton	27,293	0	0
Beaven, Bristol	27,130	0	0
Parnell & Son, Rugby (accepted)	26,536	0	0

STAMFORD-HILL.—For the erection of St. John's Vicarage. Mr. Spencer W. Grant, architect, No. 63, Finsbury-pavement, E.C. Quantities by Mr. C. W. Brooks:—

Wall Bros.	£1,679	0	0
Atherton & Latta	1,450	0	0
J. Holloway	1,420	0	0
Paine Bros., Stamford-hill*	1,385	0	0

* Accepted.

SUTTON (Surrey).—For proposed Christ Church, at Sutton, Surrey. Mr. J. T. Newman, F.R.I.B.A., architect, Fen-court, E.C. Quantities by Messrs. Curtis & Sons, London-wall, E.C.:—

Patman & Fotheringham	£9,773	0	0
B. E. Nightingale	9,562	0	0
Dove Bros.	9,225	0	0
J. Chappell	8,887	0	0
J. Morter	8,867	0	0
Gregory & Co.	8,647	0	0

***** SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, W.C., not later than 12 Noon on THURSDAYS.**

PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER, LONDON."

THE INDEX and TITLE-PAGE for Volume LII. (Jan. to June, 1887) was given as a Supplement with the last Number.

A COLOURED TITLE-PAGE may be had, gratis, on personal application at the Office.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, to hold a Month's Numbers, price 2s. each; also

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*** Stamps must not be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to DOUGLAS FOURDRINIER, Publisher,

Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY mornings.

The Publisher cannot be responsible for DRAWINGS TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office,* 46, Catherine-street, Covent Garden, W.C. *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN CIRCULATION, is issued every week.

MAP OF LONDON, showing Boundaries of Surveyors' Districts. The four Sheets, into which the Map is divided (issued with the numbers of January 1st, 8th, 15th, and 22nd), if sent to the Office direct, or through any Newsagent, can be MOUNTED on the following Terms, viz.:—

On Cloth (Rollers) and varnished, 2s. 6d.
" (Strainer) " 3s. 6d.

N.B.—In the case of "Strainers," if packed for rail or carrier 1s. 3d. extra.

*** Omissions discovered since publication will be corrected before mounting.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 13s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C.

TO CORRESPONDENTS.

Registered Telegraphic Address, "THE BUILDER, LONDON."

"A Constant Reader" (should enclose name and address).—G. R. T. (shall have proof).—R. L.—A. T. W.—A. B. (all letters should be accompanied by name and address, whether for publication or not).—A. N.—S. V.—J. A. T. (list was sent and inserted last week).—F. & O. (names and amounts should be sent in all cases).—Croydon (name and address of sender not stated).—E. A. R. (omitted last week because sent too late).—A. W. (too late).—H. E. N. (write to Mr. L. Harvey, City Guilds' Institute, Exhibition road).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

Best Bath Stone.

CORSHAM DOWN. | FARLEIGH DOWN.
BOX GROUND. | COMBE DOWN.
WESTWOOD GROUND. | STOKE GROUND.

RANDELL, SAUNDERS, & CO., LD.,
CORSHAM, WILTS.

Bath Stone.

Pictor's Monks' Park. Combe Down.
Corsham Down. Stoke Ground.
Box Ground. Winsley Ground.
Farleigh Down. West Wood.
PICTOR & SONS, Box, Wilts. [ADVT.

Doulting Freestone.

THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.

THE BRAMBLEDITCH STONE. Is of the same crystalline nature as the Chelynch Stone, but finer in texture, and more suitable for fine moulded work.

HAM HILL STONE.

Greater facilities have been provided for working these quarries, and the stone can be supplied in large quantities at short notice.

Prices, and every information given, on application to CHARLES TRASK & SONS, Norton-sub-Hamdon, near Ilminster, Somerset.
London Agent — Mr. E. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.

Doulting Free Stone For prices, &c., address S. & J. STAPLE, Quarry Owners, Stone and Lime Merchants, Stoke-under-Ham, Ilminster. [ADVT.
HAM HILL STONE,
BLUE LIAS LIME
(Ground or Lump),

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 88, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. [ADVT

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT

SPRAGUE & CO.,
LITHOGRAPHERS,
Employ a large and efficient Staff especially for Bills of Quantities, &c.
22, Martin's-lane, Cannon-street, E.C. [ADVT.

To Builders, Builders' Supply Merchants, and Others.—WHALLEY'S WATER-CLOSET, for using waste water from lavatories, sinks, roofs, &c., will flush immediately after being used. Costs 50 per cent. less than ordinary water-closets. No water cistern required. No fittings. No water supply. Simplicity and effectiveness guaranteed. Being largely adopted and giving every satisfaction.
Testimonials from Sanitary Engineers, Sanitary Inspectors, Medical Officers, &c. Highly spoken of by the leading trade papers.
Prices, drawings, and full particulars, on application to
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Towneley Colliery, Burnley. [ADVT.